

# Arizona State Retirement System

## Fixed Income Asset Class Review

August 17, 2012

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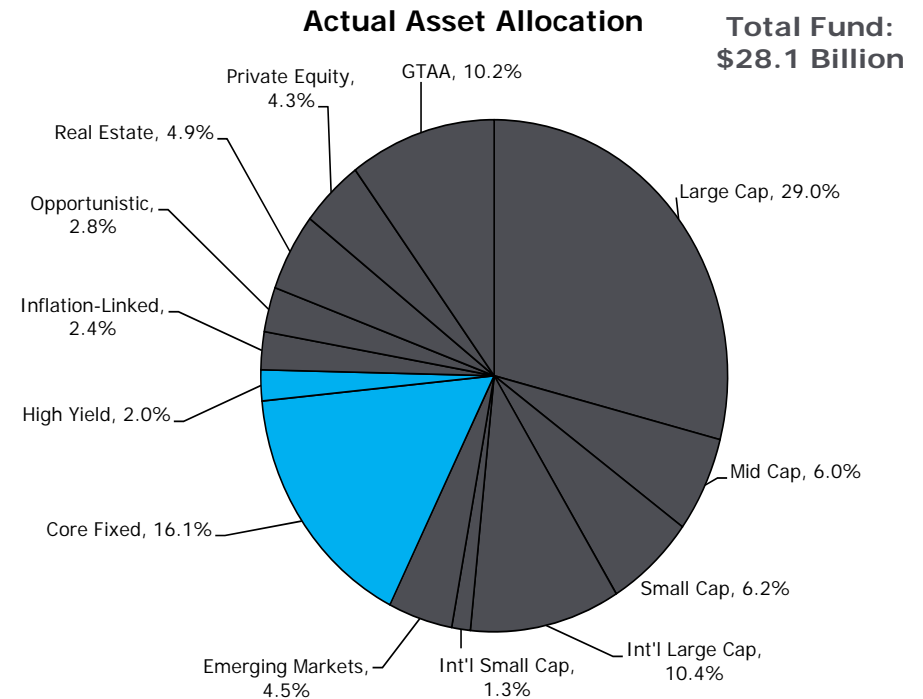
- **ASRS Fixed Income Asset Class Review (Aggregate)**
- **ASRS Opportunistic Fixed Income Investments Review**
- **Fixed Income Market Environment**
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# **Fixed Income Asset Class Overview (Aggregate)**

**Note: All of the data in this section is as of March 31, 2012, unless otherwise noted.**

## ASRS Fixed Income Asset Class Overview

- **Market Value: \$5.0 B**
- **Passive Allocation: 75%**
- **Portfolios:**
  - 2 Enhanced Passive
  - 1 Passive
  - 3 Active
    - Core: 1
    - High Yield: 2
- **Average Fees: 8 bps**



*Note: Domestic Equity, International Equity, Fixed Income, Real Estate and Commodities allocations exclude GTAA portfolios.*

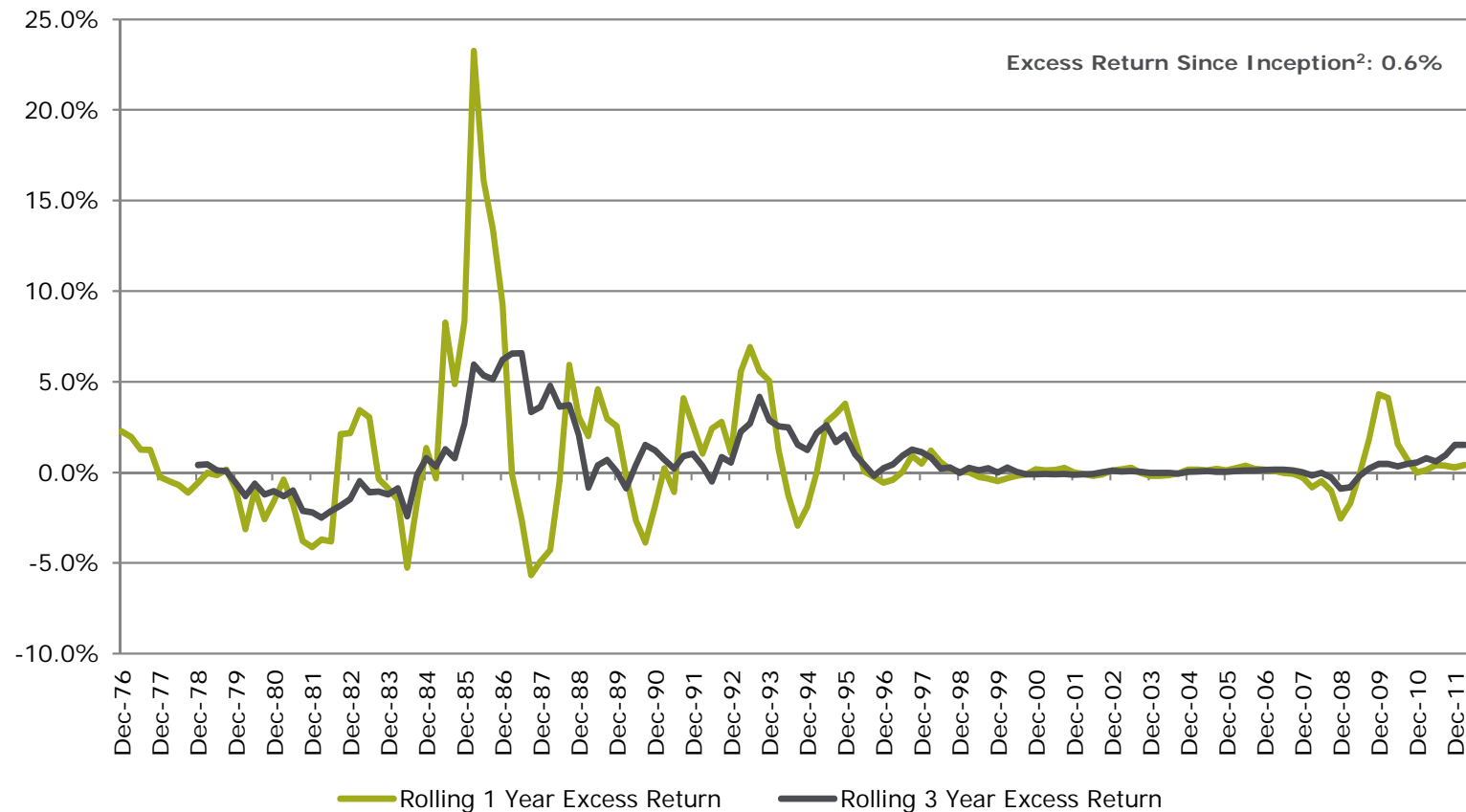
## ASRS Fixed Income Asset Class Mandates

Manager	Style	Benchmark	Inception Date	Expected Alpha (bps)	Portfolio Assets (\$MM)	Strategy Assets (\$MM)
<b>Active</b>						
PIMCO	Core	BC Aggregate	01/31/2010	50	\$700	\$14,169
Columbia	High Yield	BC High Yield	09/30/2009	150	\$401	\$14,721
Shenkman	High Yield	BC High Yield	9/30/2009	100	\$146	\$13,711
<b>Passive/Enhanced Passive</b>						
BlackRock (Enhanced Passive)	Core	BC Aggregate	9/30/2004	10	\$681	\$54,097
Internally Mgd F2 (Enhanced Passive)	Core	BC Aggregate	9/30/2000	10	\$3,062	N/A
BlackRock (Passive) <sup>1</sup>	Gov't/ Credit	BC Intermediate Gov't/Credit	12/31/2008	10	\$23	\$1,023

<sup>1</sup>System only

# ASRS Fixed Income Rolling Excess Returns

ASRS Total Fixed Income vs. ASRS Custom Fixed Income Benchmark<sup>1</sup>  
Excess Returns Since Inception<sup>2</sup> (December 1975) – March 31, 2012



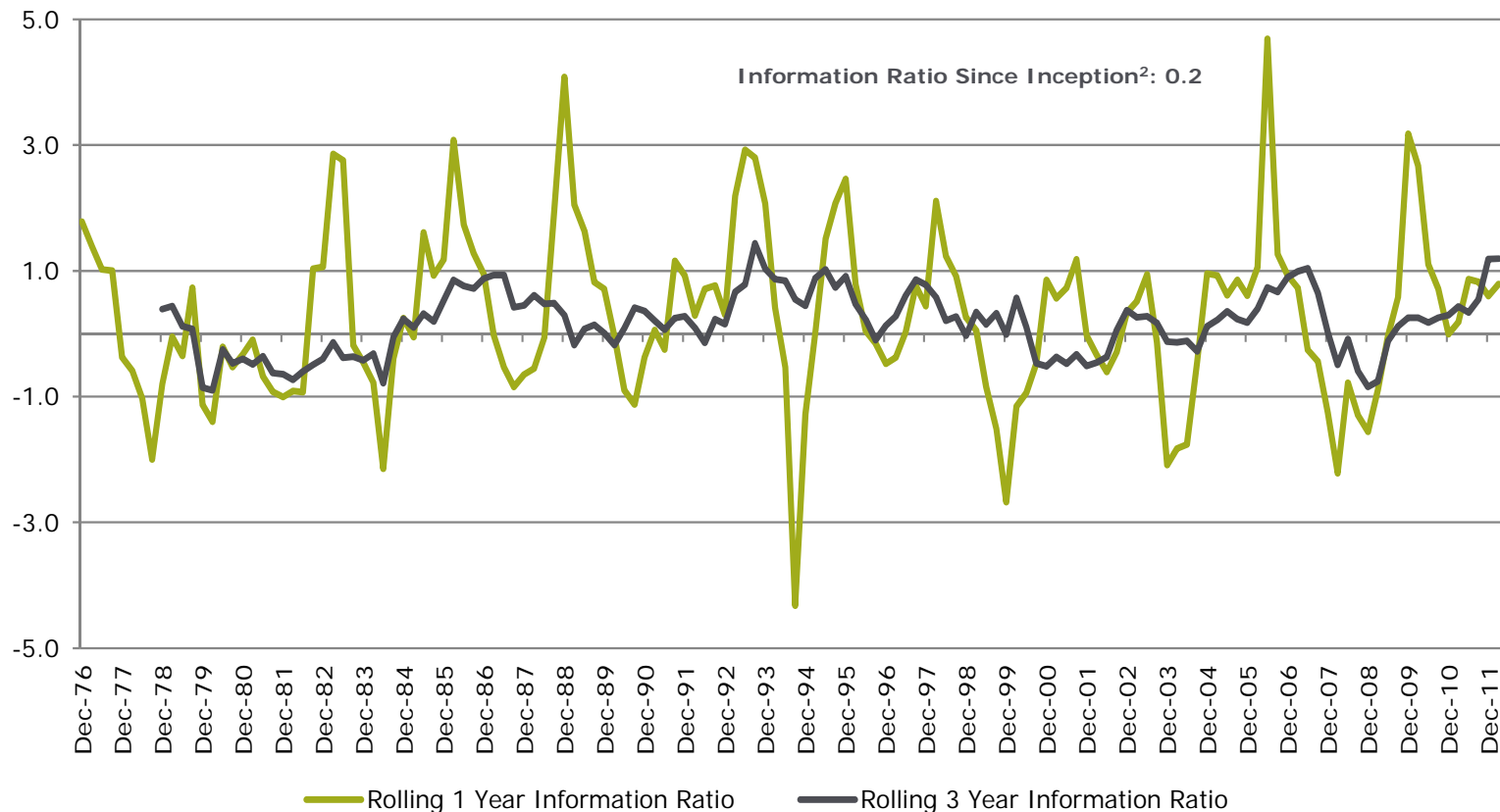
<sup>1</sup>ASRS Custom Fixed Income Benchmark was Barclays Capital U.S. Aggregate Bond Index thru 12/31/2010; 93% Barclays Capital U.S. Aggregate Bond Index / 7% Barclays Capital U.S. Corporate High Yield Bond Index thereafter.

<sup>2</sup>Inception date of the ASRS Fixed Income Composite is June 30, 1975. Performance shown since December 31, 1975 because the Barclays Capital U.S. Aggregate Bond Index began reporting performance January 1, 1976.

*Note: Based on quarterly, net of fee performance data, since inception.*

# ASRS Fixed Income Rolling Information Ratios

ASRS Total Fixed Income vs. ASRS Custom Fixed Income Benchmark<sup>1</sup>  
Information Ratios Since Inception<sup>2</sup> (December 1975) – March 31, 2012



<sup>1</sup>ASRS Custom Fixed Income Benchmark was Barclays Capital U.S. Aggregate Bond Index thru 12/31/2010; 93% Barclays Capital U.S. Aggregate Bond Index / 7% Barclays Capital U.S. Corporate High Yield Bond Index thereafter.

<sup>2</sup>Inception date of the ASRS Fixed Income Composite is June 30, 1975. Performance shown since December 31, 1975 because the Barclays Capital U.S. Aggregate Bond Index began reporting performance January 1, 1976.

*Note: Based on quarterly, net of fee performance data, since inception.*

# ASRS Fixed Income Performance as of March 31, 2012

	Ending March 31, 2012														Inception	
	Market Value	% of Portfolio	3 Mo	Rank	Fiscal YTD	Rank	1 Yr	Rank	3 Yrs	Rank	5 Yrs	Rank	10 Yrs	Rank	Return	Since
Total Fixed Income	5,013,664,428	100.0	1.0	55	5.9	26	8.0	27	8.6	50	6.8	31	6.1	40	8.9	Jul-75
ASRS Custom Fixed Income Benchmark			0.6	68	5.3	39	7.7	33	7.1	61	6.4	39	5.9	46	--	Jul-75
Over/Under			0.4		0.6		0.3		1.5		0.4		0.2			
eA All US Fixed Inc Net Median			1.1		4.8		6.7		8.6		5.9		5.7		--	Jul-75
Total Core Fixed Income	4,466,376,725	89.1	0.6	82	5.7	32	7.8	42	8.2	58	6.5	45	6.0	48	8.8	Jul-75
Barclays Aggregate			0.3	92	5.3	63	7.7	51	6.8	83	6.2	55	5.8	61	--	Jul-75
Over/Under			0.3		0.4		0.1		1.4		0.3		0.2			
eA US Core Fixed Inc Net Median			1.0		5.5		7.7		8.5		6.4		6.0		--	Jul-75
Active Core Fixed Income																
PIMCO	699,836,193	14.0	1.2	37	4.9	85	7.1	79	--	--	--	--	--	--	6.6	Feb-10
Barclays Aggregate			0.3	92	5.3	63	7.7	51	6.8	83	6.2	55	5.8	61	6.0	Feb-10
Over/Under			0.9		-0.4		-0.6								0.6	
eA US Core Fixed Inc Net Median			1.0		5.5		7.7		8.5		6.4		6.0		6.5	Feb-10
Enhanced Passive Core Fixed Income																
BlackRock - Enhanced Passive Modules	681,304,217	13.6	0.4	92	5.5	45	6.7	87	9.9	21	7.9	4	--	--	6.5	Oct-04
Barclays Aggregate			0.3	92	5.3	63	7.7	51	6.8	83	6.2	55	5.8	61	5.4	Oct-04
Over/Under			0.1		0.2		-1.0		3.1		1.7				1.1	
eA US Core Fixed Inc Net Median			1.0		5.5		7.7		8.5		6.4		6.0		5.4	Oct-04
Internally Managed F2	3,062,491,804	61.1	0.5	83	6.0	19	8.3	18	7.4	72	6.6	42	6.0	44	6.3	Oct-00
Barclays Aggregate			0.3	92	5.3	63	7.7	51	6.8	83	6.2	55	5.8	61	6.2	Oct-00
Over/Under			0.2		0.7		0.6		0.6		0.4		0.2		0.1	
eA US Core Fixed Inc Net Median			1.0		5.5		7.7		8.5		6.4		6.0		6.3	Oct-00

<sup>1</sup>ASRS Custom Fixed Income Benchmark was Barclays Capital U.S. Aggregate Bond Index thru 12/31/2010; 93% Barclays Capital U.S. Aggregate Bond Index / 7% Barclays Capital U.S. Corporate High Yield Bond Index thereafter.

Note: Performance, ranks and medians are based on net of fee performance data, since inception.



# ASRS Fixed Income Performance as of March 31, 2012

Ending March 31, 2012												Inception				
	Market Value	% of Portfolio	3 Mo Rank	Fiscal YTD Rank	1 Yr Rank	3 Yrs Rank	5 Yrs Rank	10 Yrs Rank	Return	Since						
Passive Intermediate Gov't/Credit Fixed Income																
BlackRock Intermediate Gov't/Credit Bond Index	22,744,510	0.5	0.6	80	4.0	50	6.2	36	6.0	59	--	--	5.5	Jan-09		
Barclays Int Govt/Credit			0.6	82	3.9	58	6.1	45	5.9	62	5.7	47	5.3	45	5.4	Jan-09
Over/Under			0.0		0.1		0.1		0.1						0.1	
eA US Interm Duration Fixed Inc Net Median			1.1		4.0		5.9		6.5		5.6		5.2		6.2	Jan-09
Total High Yield Fixed Income	547,287,703	10.9	4.6	70	5.8	30	6.4	32	--	--	--	--	--	--	11.4	Oct-09
Barclays High Yield			5.3	42	5.3	41	6.5	31	23.9	16	8.1	24	9.2	32	12.8	Oct-09
Over/Under			-0.7		0.5		-0.1								-1.4	
eA US High Yield Fixed Inc Net Median			5.1		4.9		5.8		20.1		6.8		8.5		11.7	Oct-09
Active High Yield Fixed Income																
Columbia Management	401,035,917	8.0	4.8	59	5.9	27	6.8	24	--	--	--	--	--	--	11.8	Oct-09
Barclays High Yield			5.3	42	5.3	41	6.5	31	23.9	16	8.1	24	9.2	32	12.8	Oct-09
Over/Under			-0.5		0.6		0.3								-1.0	
eA US High Yield Fixed Inc Net Median			5.1		4.9		5.8		20.1		6.8		8.5		11.7	Oct-09
Shenkman	146,251,786	2.9	4.0	92	5.3	45	5.6	54	--	--	--	--	--	--	10.9	Oct-09
Barclays High Yield			5.3	42	5.3	41	6.5	31	23.9	16	8.1	24	9.2	32	12.8	Oct-09
Over/Under			-1.3		0.0		-0.9								-1.9	
eA US High Yield Fixed Inc Net Median			5.1		4.9		5.8		20.1		6.8		8.5		11.7	Oct-09

<sup>2</sup>System Only

Note: Performance, ranks and medians are based on net of fee performance data, since inception.

# ASRS Fixed Income Performance as of June 30, 2012

			Ending June 30, 2012												Inception	
	Market Value	% of Portfolio	3 Mo	Rank	YTD	Rank	1 Yr	Rank	3 Yrs	Rank	5 Yrs	Rank	10 Yrs	Rank	Return	Since
Total Fixed Income	4,907,540,237	100.0	2.0	35	3.0	56	8.1	26	8.0	48	7.3	30	6.0	42	8.9	Jul-75
ASRS Custom Fixed Income Benchmark			2.1	34	2.7	62	7.5	38	7.2	58	6.9	40	5.7	47	--	Jul-75
Over/Under			-0.1		0.3		0.6		0.8		0.4		0.3			
eA All US Fixed Inc Net Median			1.6		3.3		6.5		7.9		6.4		5.6		--	Jul-75
Total Core Fixed Income	4,145,854,241	84.5	2.0	61	2.6	79	7.8	41	7.6	60	7.1	52	5.8	51	8.8	Jul-75
Barclays Aggregate			2.1	54	2.4	90	7.5	61	6.9	81	6.8	62	5.6	61	--	Jul-75
Over/Under			-0.1		0.2		0.3		0.7		0.3		0.2			
eA US Core Fixed Inc Net Median			2.1		3.1		7.7		7.9		7.1		5.8		--	Jul-75
Active Core Fixed Income																
PIMCO	716,363,124	14.6	2.3	25	3.5	35	7.3	73	--	--	--	--	--	--	6.9	Feb-10
Barclays Aggregate			2.1	54	2.4	90	7.5	61	6.9	81	6.8	62	5.6	61	6.3	Feb-10
Over/Under			0.2		1.1		-0.2								0.6	
eA US Core Fixed Inc Net Median			2.1		3.1		7.7		7.9		7.1		5.8		6.7	Feb-10
Enhanced Passive Core Fixed Income																
BlackRock - Enhanced Passive Modules	326,183,403	6.6	1.6	88	1.9	97	7.2	77	8.4	29	8.4	9	--	--	6.5	Oct-04
Barclays Aggregate			2.1	54	2.4	90	7.5	61	6.9	81	6.8	62	5.6	61	5.5	Oct-04
Over/Under			-0.5		-0.5		-0.3		1.5		1.6				1.0	
eA US Core Fixed Inc Net Median			2.1		3.1		7.7		7.9		7.1		5.8		5.6	Oct-04
Internally Managed F2	3,080,220,155	62.8	2.1	56	2.6	82	8.1	24	7.2	69	7.1	50	5.8	50	6.4	Oct-00
Barclays Aggregate			2.1	54	2.4	90	7.5	61	6.9	81	6.8	62	5.6	61	6.2	Oct-00
Over/Under			0.0		0.2		0.6		0.3		0.3		0.2		0.2	
eA US Core Fixed Inc Net Median			2.1		3.1		7.7		7.9		7.1		5.8		6.3	Oct-00

<sup>1</sup>ASRS Custom Fixed Income Benchmark was Barclays Capital U.S. Aggregate Bond Index thru 12/31/2010; 93% Barclays Capital U.S. Aggregate Bond Index / 7% Barclays Capital U.S. Corporate High Yield Bond Index thereafter.

Note: Performance, ranks and medians are based on net of fee performance data, since inception.

# ASRS Fixed Income Performance as of June 30, 2012

			Ending June 30, 2012												Inception	
	Market Value	% of Portfolio	3 Mo Rank		YTD Rank		1 Yr Rank		3 Yrs Rank		5 Yrs Rank		10 Yrs Rank		Return	Since
Passive Intermediate Gov't/Credit Fixed Income																
BlackRock Intermediate Gov't/Credit Bond Index	23,087,559	0.5	1.5	38	2.2	74	5.6	48	5.9	60	--	--	--	--	5.5	Jan-09
Barclays Int Gov't/Credit			1.5	39	2.1	75	5.4	59	5.8	62	6.0	55	5.1	46	5.4	Jan-09
Over/Under			0.0		0.1		0.2		0.1						0.1	
eA US Interm Duration Fixed Inc Net Median			1.4		2.6		5.5		6.2		6.1		5.0		6.2	Jan-09
Total High Yield Fixed Income	761,685,996	15.5	1.6	39	6.3	69	7.5	27	--	--	--	--	--	--	11.0	Oct-09
Barclays High Yield			1.8	22	7.3	33	7.3	32	16.3	21	8.4	18	10.2	25	12.3	Oct-09
Over/Under			-0.2		-1.0		0.2								-1.3	
eA US High Yield Fixed Inc Net Median			1.5		6.7		6.3		14.6		7.1		9.1		11.3	Oct-09
Active High Yield Fixed Income																
Columbia Management	613,494,599	12.5	1.8	24	6.7	52	7.9	18	--	--	--	--	--	--	11.4	Oct-09
Barclays High Yield			1.8	22	7.3	33	7.3	32	16.3	21	8.4	18	10.2	25	12.3	Oct-09
Over/Under			0.0		-0.6		0.6								-0.9	
eA US High Yield Fixed Inc Net Median			1.5		6.7		6.3		14.6		7.1		9.1		11.3	Oct-09
Shenkman	148,191,397	3.0	1.2	72	5.2	93	6.6	45	--	--	--	--	--	--	10.3	Oct-09
Barclays High Yield			1.8	22	7.3	33	7.3	32	16.3	21	8.4	18	10.2	25	12.3	Oct-09
Over/Under			-0.6		-2.1		-0.7								-2.0	
eA US High Yield Fixed Inc Net Median			1.5		6.7		6.3		14.6		7.1		9.1		11.3	Oct-09

<sup>2</sup>System Only

Note: Performance, ranks and medians are based on net of fee performance data, since inception.

## ASRS Opportunistic Fixed Income Investments Overview

- **Opportunistic Investments (Public or Private) are defined as:**
  - Being tactical in nature. That is, they should capitalize on temporary opportunities created by market conditions/dislocations AND...
  - Be outside of the Total Fund Benchmark; or
  - If within the Total Fund Benchmark, the strategy will be absolute return oriented.
  - Be agnostic to other asset classes.
- **Policy Allocation: 0% (0-10%)**
- **Actual Exposure: 2.8% - ASRS views its exposure in context with Fixed Income**
- **Portfolio Structure – LP/GP or Separate Account**

# ASRS Fixed Income Opportunistic Investments Performance Score Card

As of December 31, 2011 (Official) \*

Fund	Inception Date	Committed (\$Mil)	MV (\$ Mil)	ITD (TWR)	ITD (IRR)	Absolute Return Expectation (net)	Barclays Agg. ITD	Total Fund ITD#
BlackRock Mortgage Investors – LP/GP	3/28/08	\$75	\$87	4.1%	4.1%	14%	6.3%	1.0%
BlackRock Credit Investors – LP/GP <sup>1</sup>	9/29/08	\$100	\$21	23.4%	16.0%	12%	7.5%	3.4%
Guggenheim Partners – SA	10/1/08	\$150	\$248	18.5%	19.5%	10%	7.6%	3.4%
TCW Capital Trust – LP/GP	9/29/09	\$150	\$152	10.1%	8.0%	10%	6.4%	13.5%
Credit Suisse Opportunistic –SA	10/22/09	\$200	\$168	10.1%	9.8%	10%	6.6%	13.5%
GSO –LP/GP	1/15/10	\$200	\$130	15.7%	11.8%	13%	6.7%	8.8%
Oaktree Opportunities Fund VIII –LP/GP	5/6/10	\$50	\$52	7.1%	4.0%	15%	6.4%	6.5%
Sankaty Advisors, LLC <sup>2</sup>	6/30/11	\$300	\$20	-0.8%	-1.7%	n/a	5.0%	-3.5%
Oaktree Opportunities Fund VIIIb –LP/GP	8/22/11	\$150	\$30	1.3%	-1.7%	15%	1.5%	-3.5%

As of March 31, 2012 (Preliminary)

Fund	Inception Date	Committed (\$Mil)	MV (\$ Mil)	ITD (TWR)	ITD (IRR)	Absolute Return Expectation (net)	Barclays Agg. ITD	Total Fund ITD#
BlackRock Mortgage Investors – LP/GP	3/28/08	\$75	\$95	n/a	6.4%	14%	5.9%	2.9%
BlackRock Credit Investors – LP/GP <sup>1</sup>	9/29/08	\$100	\$20	n/a	16.6%	12%	6.8%	5.4%
Guggenheim Partners – SA	10/1/08	\$150	\$260	n/a	19.5%	10%	7.2%	5.4%
TCW Capital Trust – LP/GP	9/29/09	\$150	\$154	n/a	8.7%	10%	5.9%	15.5%
Credit Suisse Opportunistic –SA	10/22/09	\$200	\$27	n/a	9.0%	10%	6.0%	15.5%
GSO –LP/GP	1/15/10	\$200	\$132	n/a	13.5%	13%	6.1%	11.5%
Oaktree Opportunities Fund VIII –LP/GP	5/6/10	\$50	\$55	n/a	8.3%	15%	5.7%	10.0%
Sankaty Advisors, LLC <sup>2</sup>	6/30/11	\$300	\$20	n/a	-1.7%	n/a	5.3%	4.7%
Oaktree Opportunities Fund VIIIb –LP/GP	8/22/11	\$150	\$46	n/a	4.6%	15%	1.8%	4.7%
Avenue Europe Special Situations Fund II	12/16/11	\$250	\$43	n/a	4.6%	8%	0.4%	8.5%

\*Included in 1Q12 TF performance reported at the August 17, 2012 Board Meeting. Performance is reported on a one quarter lag, and market values are adjusted for cash flows through March 31, 2012.

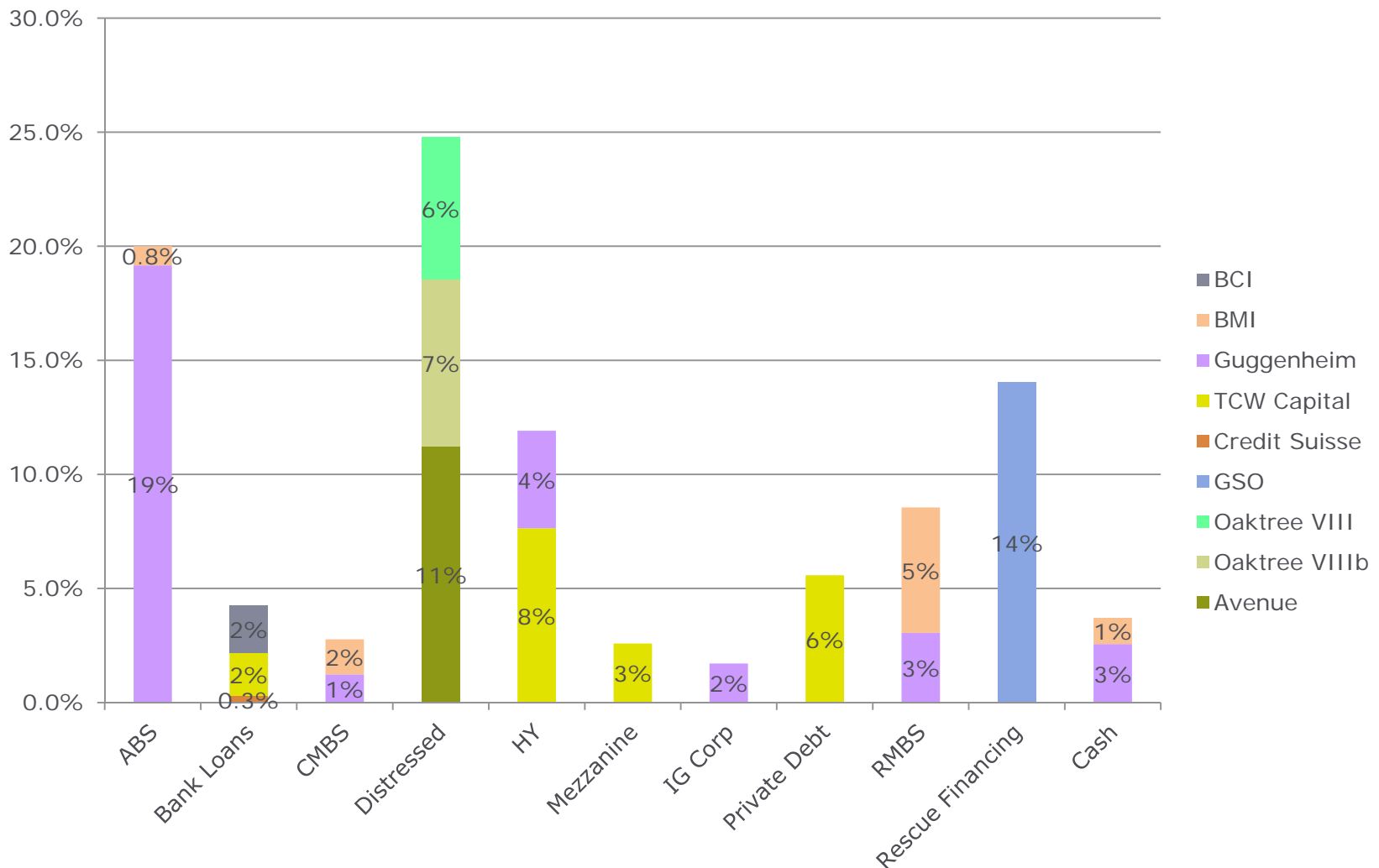
<sup>1</sup>BlackRock Credit Investors returned all capital and redeemed the fund in October 2009; however, the fund re-called \$33.5mm on June 18, 2010.

<sup>2</sup>Sankaty Advisors was defunded during 4Q11 and 1Q12.

#Total Fund ITD uses closed quarter end for the starting date.

# Opportunistic Investments Overview

Composition per Security Type (as of June 30, 2012)



Note: Distressed includes corporate bonds and non-debt securities (e.g. warrants, preferred stock and common equity) designated by the manager as "distressed" based on a number of factors including ratings (generally below Caa3 or CCC-), trading level (substantial discount to par), expected return, and/or other circumstances (likelihood of bankruptcy or out-of-court restructuring).

## Primary Takeaways

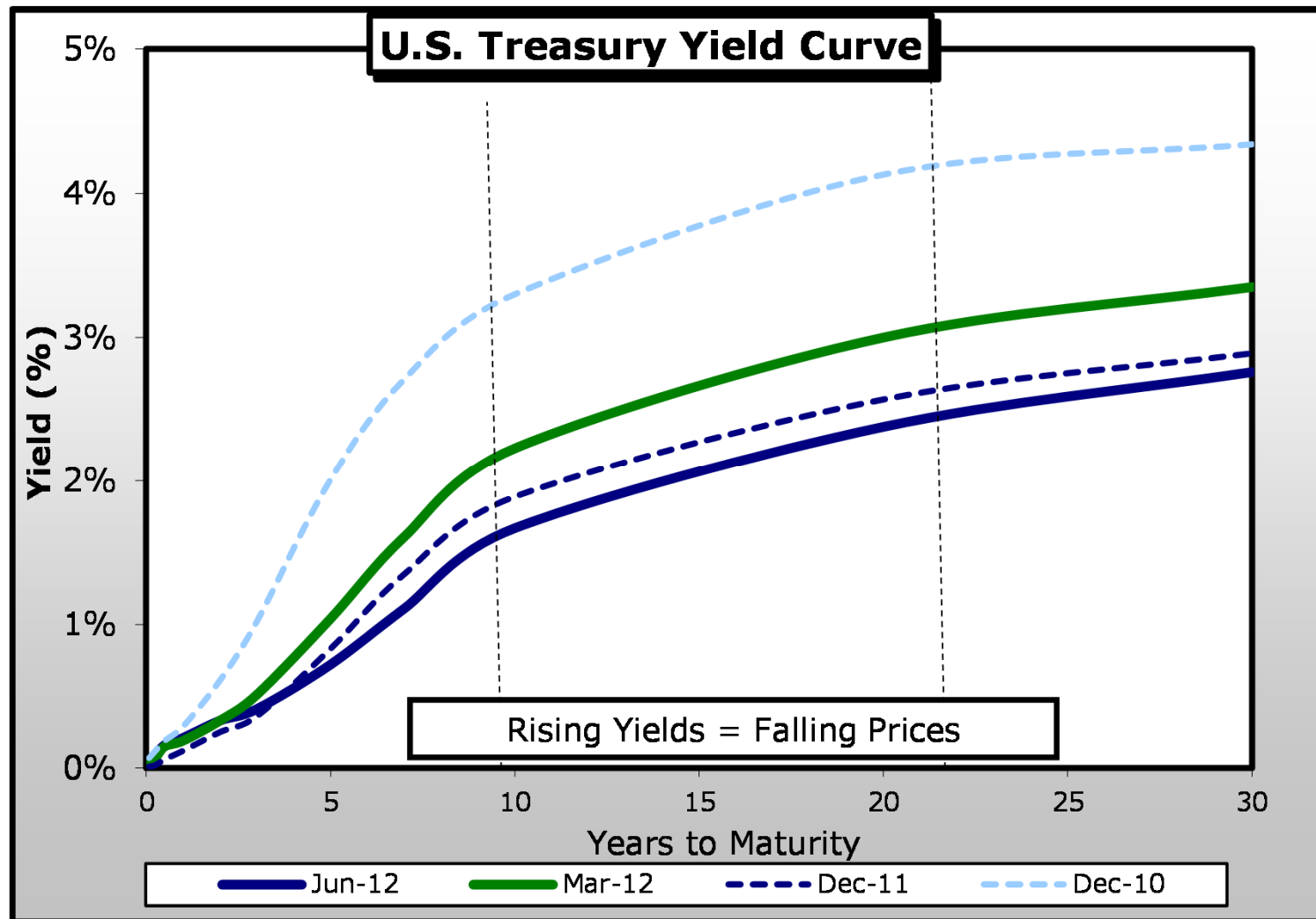
- **Over the past decade, the ASRS Fixed Income Portfolio has benefited from a falling interest rate environment which has enabled it to generate mid-to-high single digit annualized returns over the past one-, three-, five- and ten-year periods. The portfolio has produced excess returns relative to its benchmark in each of these periods.**
  - For the one-year period ended June 30, 2012, the aggregate portfolio produced 0.6% of excess return, which was primarily attributable to the outperformance of the internally managed F2 enhanced passive portfolio, which accounted for ~63% of the ASRS Fixed Income Portfolio as of June 30, 2012. In addition, the outperformance of Columbia, a high yield manager, positively contributed to the excess return.
  - For the three-, five- and ten-year periods, the aggregate portfolio produced excess returns of 0.8%, 0.4%, and 0.3%, respectively, primarily due to the outperformance of the internally managed F2 enhanced passive portfolio and the BlackRock enhanced passive core funds.
- **With record low levels of interest rates, ASRS has begun to shift assets away from low-yielding, treasury-sensitive core markets to higher-yielding asset classes including high yield bonds, emerging market debt and private debt.**
  - In December 2011 and June 2012, ASRS tactically increased its allocation to high yield bringing its weighting to 2.8% at June 30, 2012 vs. a policy target of 2.0%.
  - With the adoption of a new SAA by ASRS in June 2012, ASRS has initiated a search for additional high yield managers to boost its allocation closer to the new 5% policy target. In addition, ASRS has initiated searches for managers in two new asset classes, emerging market debt and private debt, with policy target weights of 4% and 3%, respectively.

# Fixed Income Market Environment

**Note: All of the data in this section is as of June 30, 2012, unless otherwise noted.**

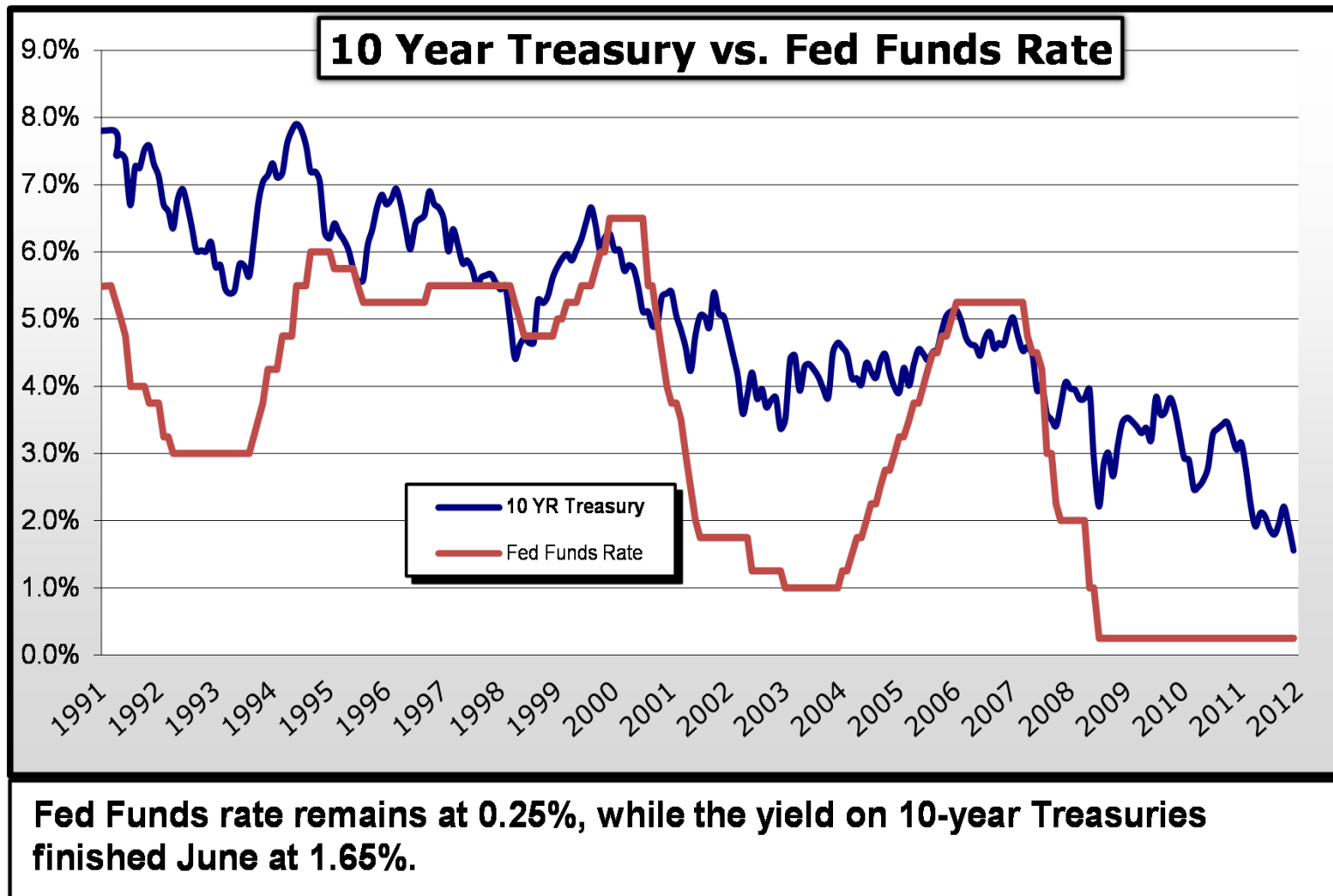


## Treasury Yields at Secular Lows



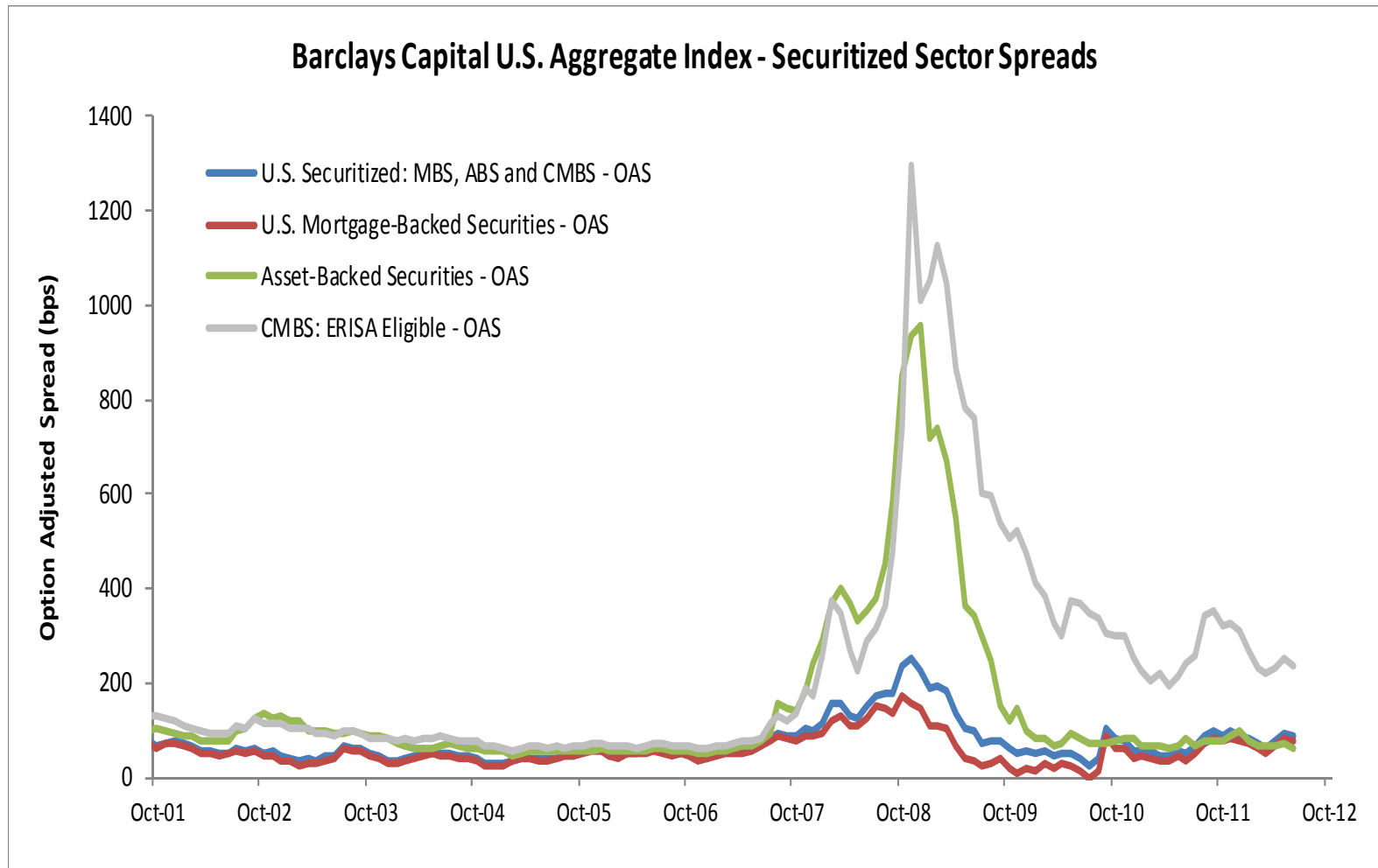
Source: U.S. Treasury

## 10-Year Treasury Yields



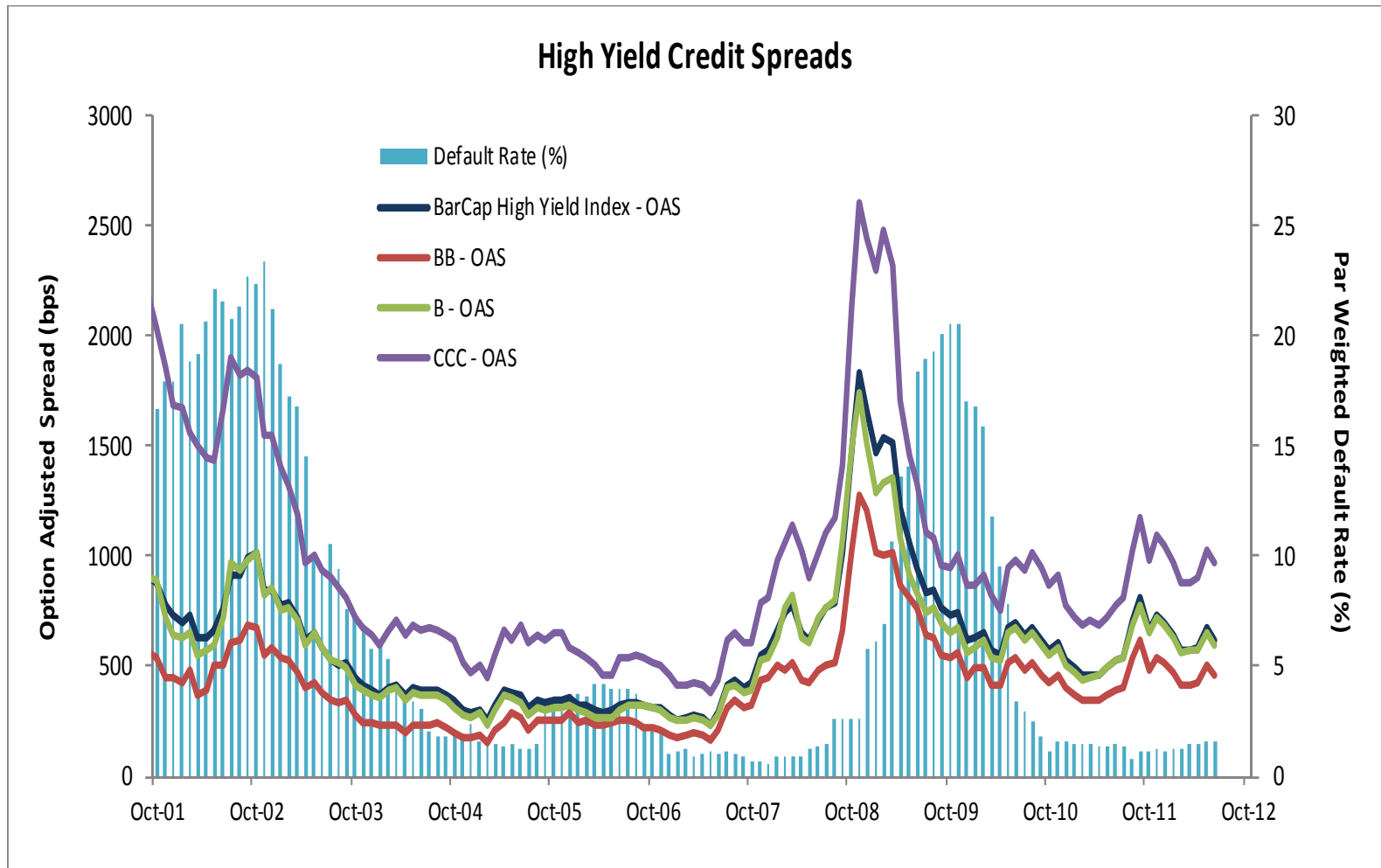
Source: Bloomberg

## Securitized Spreads



Source: Barclays Capital via PIMCO

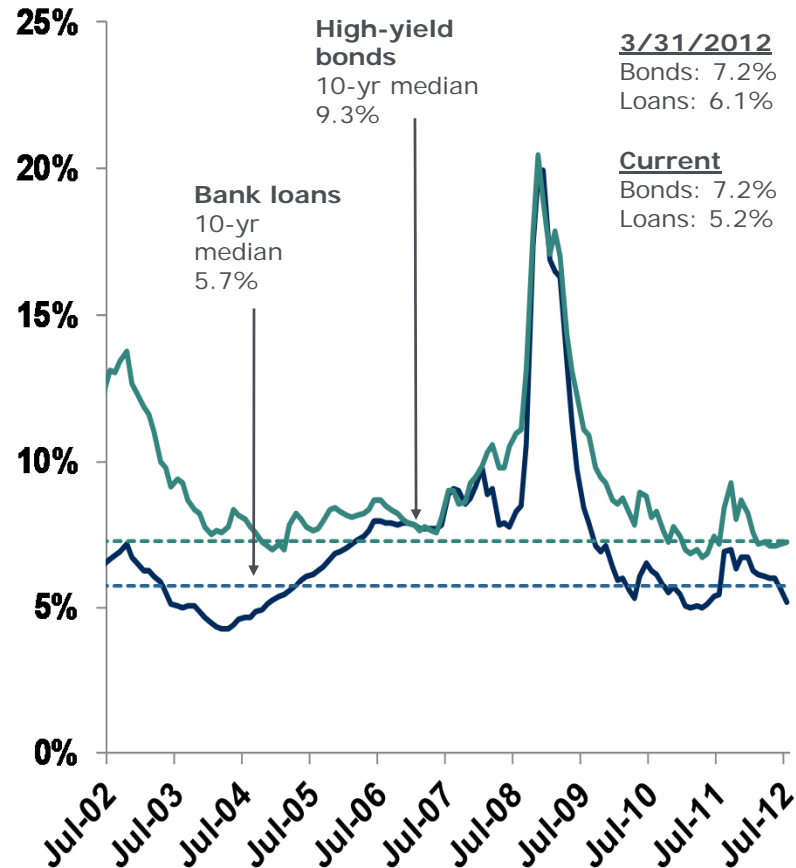
# High Yield Credit Spreads



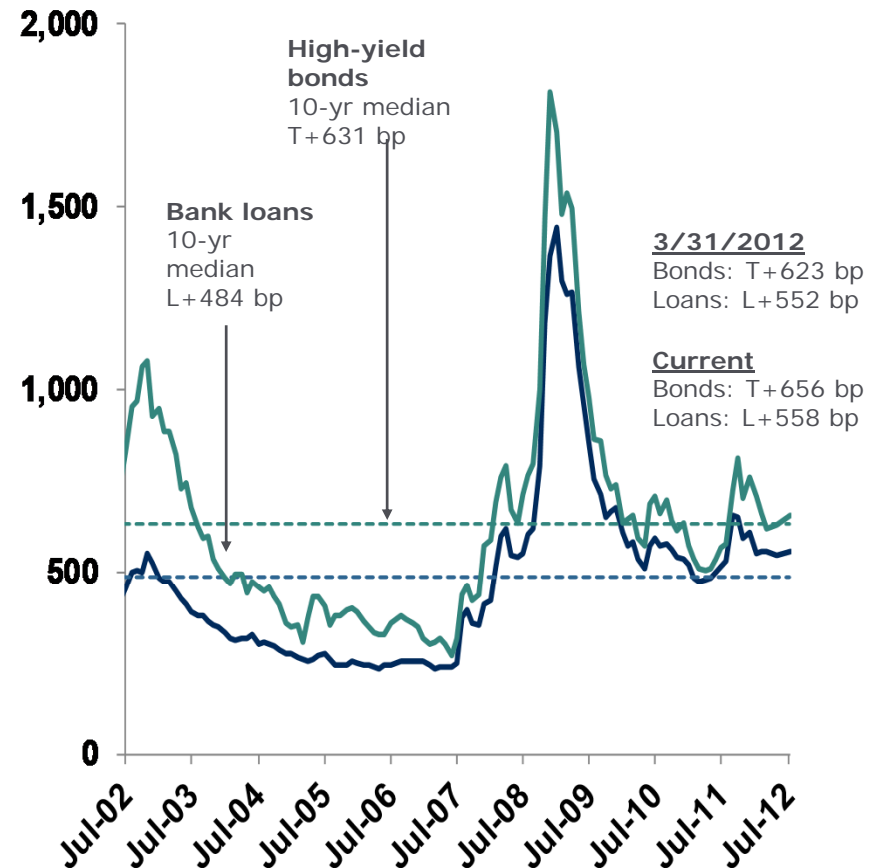
Source: Barclays Capital, Moody's Investor Services via PIMCO

# Yields are Tight Relative to Historic Levels; Spreads are Compensating for the Risk-Free Rate, Making Credit Attractive

## Loan and Bond Yields



## Loan and Bond Spreads (bps)



Source: Credit Suisse and LSTA via Sankaty Advisors. Loan spreads assume 4-yr. refi.  
Current data as of 7/12/2012.

# Broad Sector Excess Returns

Barclays Capital Fixed Income Indices relative to Treasuries (excess return) 1998-2012

	Agencies	MBS	ABS	CMBS Inv. Grade	U.S. Credit	Intermediate Credit	Long Credit	U.S. High Yield	EMD
Quality Ranking	High	High	High	High	Medium	Medium	Medium	Low	Low
1998	-49	-90	-88	n/a	-238	-150	-381	-843	-2046
1999	41	113	137	87	170	164	182	476	2417
2000	-13	-77	43	-41	-463	-237	-1003	-1897	148
2001	73	-75	139	131	277	138	667	-285	-541
2002	96	173	-16	210	-187	-129	-371	-1329	23
2003	27	11	181	201	527	439	824	2642	2465
2004	78	142	142	118	159	151	190	800	823
2005	13	-37	32	15	-85	-25	-291	47	959
2006	75	122	87	137	119	107	156	843	702
2007	-52	-185	-634	-435	-464	-399	-655	-777	-457
2008	-110	-255	-2223	-3274	-1786	-1504	-2719	-3832	-2842
2009	238	482	2496	2960	1990	1707	2880	5955	3797
2010	72	230	169	1501	192	212	124	974	508
2011	19	-113	52	47	-322	-197	-696	-240	-537
YTD	48	43	147	365	256	279	195	599	465

Source: Barclays Capital via JP Morgan Asset Management  
YTD as of June 30, 2012  
The table above is shown for illustrative purposes only.

## **Fixed Income Manager Reviews (Individual)**

**Note: All of the data in this section is as of March 31, 2012, unless otherwise noted.**

## Manager Assessment (NEPC)

Manager	Strategy	Conviction Level	NEPC Focused Placement List Strategy
PIMCO	Active Core	High	Yes
Columbia	Active High Yield	High	Yes
Shenkman	Active High Yield	Mild	No
BlackRock	Enhanced Passive Core	Mild	No
BlackRock <sup>1</sup>	Passive Government/Credit	Mild	No

“High Conviction Level” strategies denote NEPC’s belief that the manager has above average prospects of generating alpha going forward.

“Mild Conviction Level” strategies denote NEPC’s belief that the manager has average prospects of generating alpha going forward.

“Low Conviction Level” strategies denote NEPC’s belief that the manager has below average prospects of generating alpha going forward.

**NEPC Focused Placement List (FPL) Strategies** are those strategies that have been vetted by the respective research analyst/consultant and NEPC’s Due Diligence Committee, and subsequently approved for broad application across NEPC’s client base. FPL strategies represent the highest conviction managers with whom we have thoroughly reviewed and believe have investment theses that present a competitive advantage in their respective areas of opportunity. Note that NEPC does not receive any compensation from investment managers as a result of their inclusion on our FPL, nor does inclusion on the FPL guarantee that the investment manager will ultimately be awarded a mandate with an NEPC client. FPLs are continuously monitored throughout the year, and officially updated once per year. Criteria for inclusion vary per asset class.

<sup>1</sup>System only



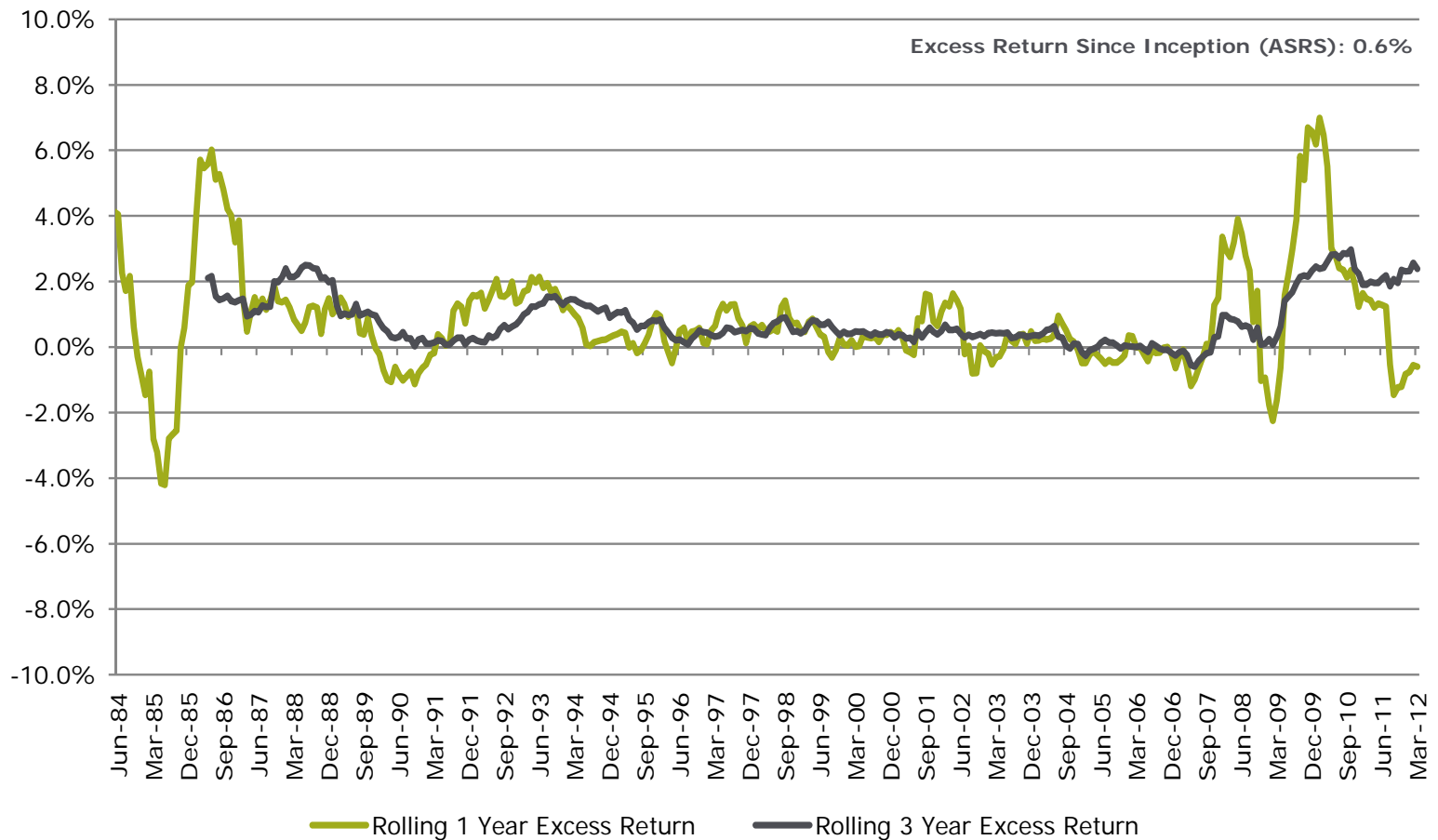
# Pacific Investment Management Company LLC (PIMCO)

## Qualitative Analysis

Factors	Description
People	<ul style="list-style-type: none"> <li>▪ PIMCO employs 625 investment professionals.</li> <li>▪ PIMCO's decision making process at all levels (business, macro-economic forecasting, portfolio strategy, etc.) works on a consensus approach, so one individual's departure is not critical to the on-going operation of the firm.</li> <li>▪ As it relates to the retirement of key PIMCO professionals, succession planning is handled months, sometimes even years, leading up to the retirement. Each year, every Managing Director provides the CEO with a list of potential successors, both in the event of an immediate emergency and for longer-term development.</li> <li>▪ PIMCO has great depth in senior management with 53 Managing Directors, 105 Executive Vice Presidents, and 182 Senior Vice Presidents, giving the firm a breadth of talent from which to draw. In addition, PIMCO's size, growth and structure ensure that they are perpetually developing more seasoned professionals in both the client service and portfolio management groups.</li> </ul>
Philosophy	<ul style="list-style-type: none"> <li>• PIMCO's Total Return philosophy revolves around the principle of diversification. They believe that no single risk should dominate returns. By diversifying strategies, or relying on multiple sources of value, PIMCO is confident that they will be able to generate a solid track record with a high degree of consistency.</li> <li>• PIMCO's size allows their professionals access to corporations' top management, which is integral to the evaluation process. They meet with management as necessary to remain current on the financial and operating conditions of a company. PIMCO concentrates their efforts on companies that have strong underlying businesses, a strong competitive position within their industries, and financial flexibility. PIMCO focuses their investments in those issues that show improving credit profiles, the potential for upgrade by the rating agencies and, therefore, greater potential for capital appreciation.</li> </ul>
Process	<ul style="list-style-type: none"> <li>• PIMCO's investment process includes both top-down and bottom-up decision-making. The first and most important step in the process is to get the long run right. PIMCO believes analyzing secular economic and political influences is fundamental to sound portfolio decisions. Holding a definitive, long-term view helps guard against becoming caught up in periodic bouts of euphoria and depression that often characterize financial markets. PIMCO is much more optimistic about their skill in identifying long-run value through fundamental economic and credit analysis than their ability to time short-term market movements.</li> <li>• PIMCO considers secular analysis so important that they devote three-days each year to what is called the "Secular Forum," at which PIMCO formulates their outlook for global bond markets over the next three to five years. Selected members of the investment staff are assigned secular topics to monitor, including monetary and fiscal policy, inflation, demographics, technology, productivity trends, and global trade. At the Secular Forum, PIMCO's secular researchers summarize their findings for all of the firm's investment professionals.</li> <li>• PIMCO investment professionals meet quarterly in "Economic Forums" to evaluate growth and inflation over the business cycle horizon of the next 6-12 months. Presentations by four regional research teams covering North America, Europe, Asia and the Emerging Markets, offer a foundation for intensive evaluation by their investment professionals.</li> <li>• These "Economic Forums" are followed by "Strategy Week", where specialty desks present their sector views and top trade ideas. The bottom-up ideas from "Strategy Week" complement the top-down insights from the "Economic Forum" and culminates in the development of a model portfolio and formalized risk targets.</li> <li>• PIMCO's Investment Committee meets throughout the year, 4x a week for 3 hours/day to discuss the markets and refine portfolio targets.</li> <li>• PIMCO's portfolio management group, through the incorporation of the model portfolio characteristics, constructs individual portfolios. The structure of this group resembles a hub and spoke system, with senior generalist portfolio managers comprising the hub and a group of sector specialists the spokes.</li> </ul>

# Pacific Investment Management Company LLC (PIMCO)

PIMCO vs. Barclays Capital U.S. Aggregate  
Excess Returns Since Inception<sup>1</sup> (June 1983) – March 31, 2012

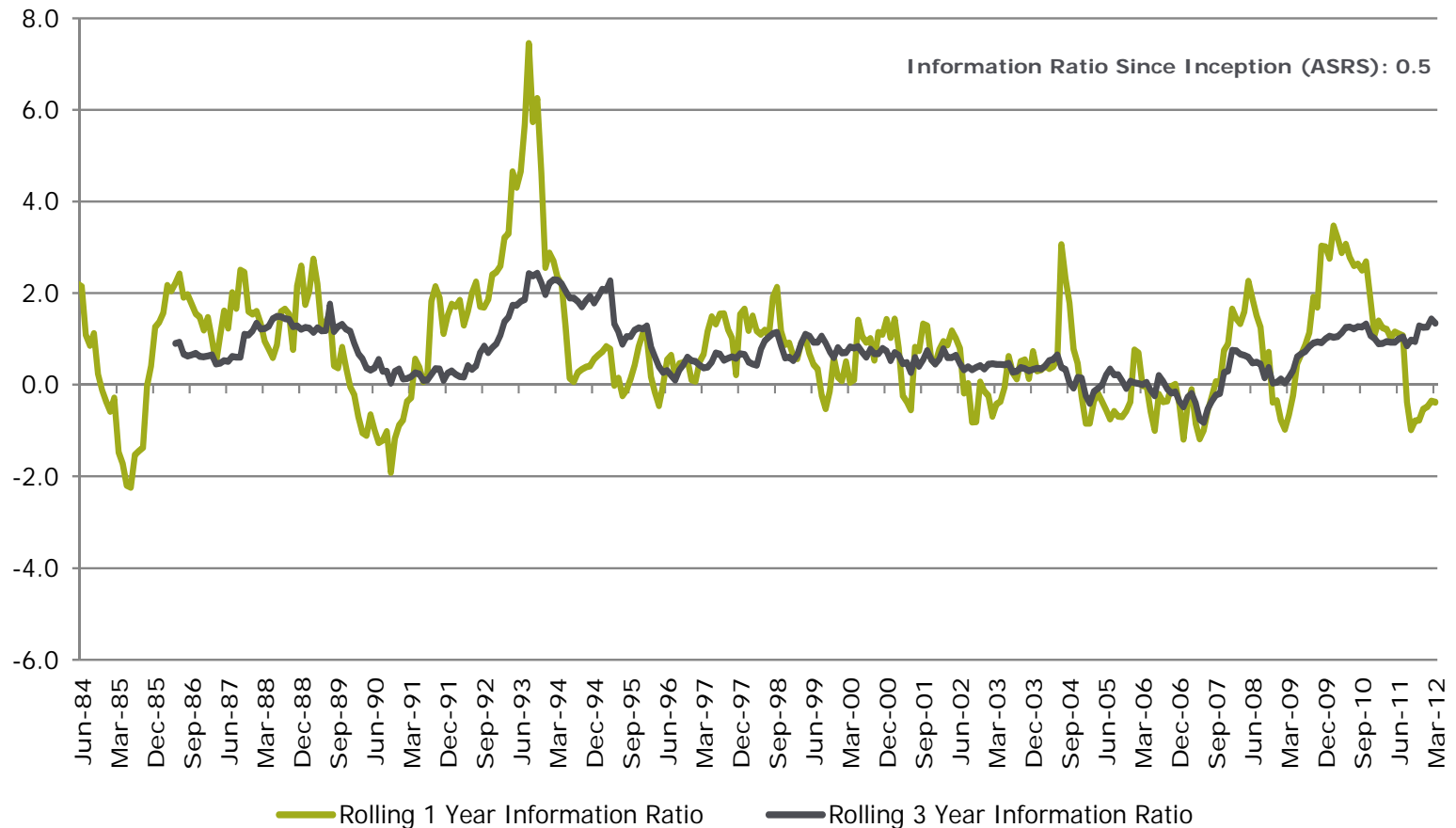


<sup>1</sup>Net of fee performance of the PIMCO Core Fixed Income - Total Return Composite is linked with ASRS portfolio performance. Composite data provided by eVestment Alliance. Inception date of the ASRS portfolio is January 31, 2010.

*Note: Based on monthly, net of fee performance data, since inception.*

# Pacific Investment Management Company LLC (PIMCO)

PIMCO vs. Barclays Capital U.S. Aggregate  
Information Ratios Since Inception<sup>1</sup> (June 1983) – March 31, 2012

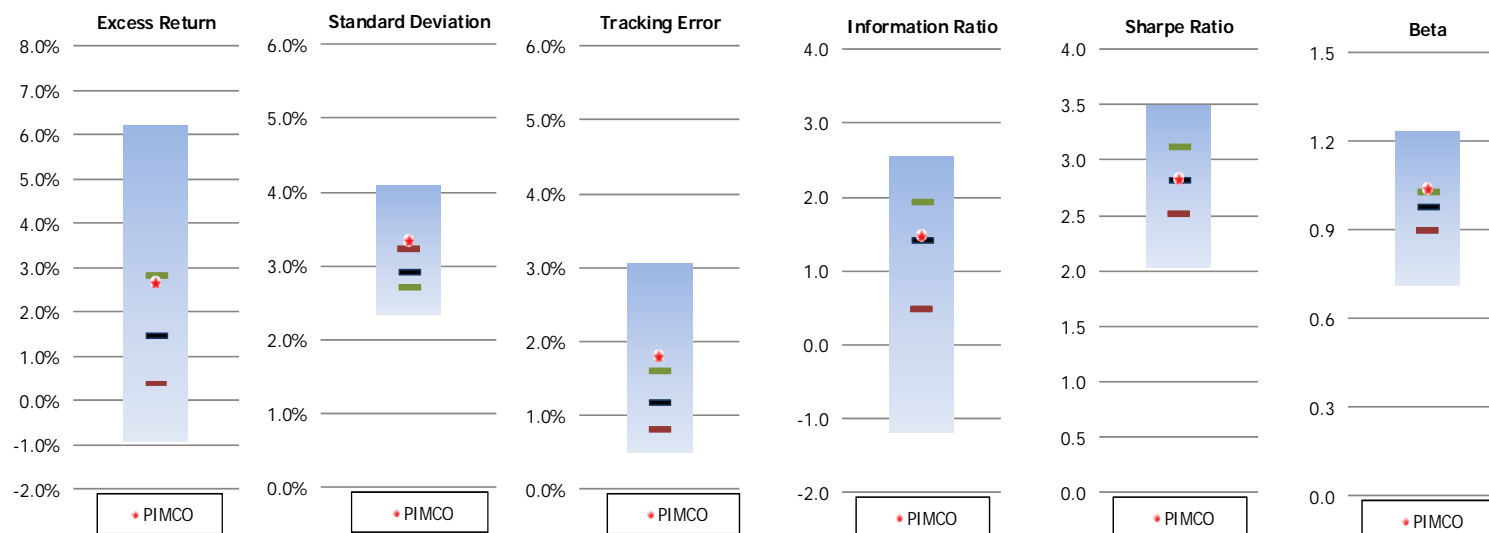


<sup>1</sup>Net of fee performance of the PIMCO Core Fixed Income - Total Return Composite is linked with ASRS portfolio performance. Composite data provided by eVestment Alliance. Inception date of the ASRS portfolio is January 31, 2010.

*Note: Based on monthly, net of fee performance data, since inception.*

# Pacific Investment Management Company LLC (PIMCO)

## PIMCO vs. Barclays Capital U.S. Aggregate Risk and Return Characteristics vs. Core Fixed Income Universe For the three-year period ending March 31, 2012<sup>1</sup>



	Excess Return	Standard Deviation	Tracking Error	Information Ratio	Sharpe Ratio	Beta
PIMCO	2.7%	3.3%	1.8%	1.5	2.8	1.0
Rank	28	79	21	48	51	24
5th Percentile	6.2%	2.4%	3.1%	2.6	3.5	1.2
Upper Quartile	2.8%	2.7%	1.6%	1.9	3.1	1.0
Median	1.5%	2.9%	1.2%	1.4	2.8	1.0
Lower Quartile	0.4%	3.2%	0.8%	0.5	2.5	0.9
95th Percentile	-0.9%	4.1%	0.5%	-1.2	2.0	0.7
Observations	253	253	253	253	253	253

<sup>1</sup>Gross of fee performance of the PIMCO Core Fixed Income - Total Return Composite is linked with ASRS portfolio performance. Composite data provided by eVestment Alliance. Inception date of the ASRS portfolio is January 31, 2010.

Note: Based on monthly, gross of fee performance data, since inception. Universe rankings are against the eVestment Alliance universe of managers as of March 31, 2012.

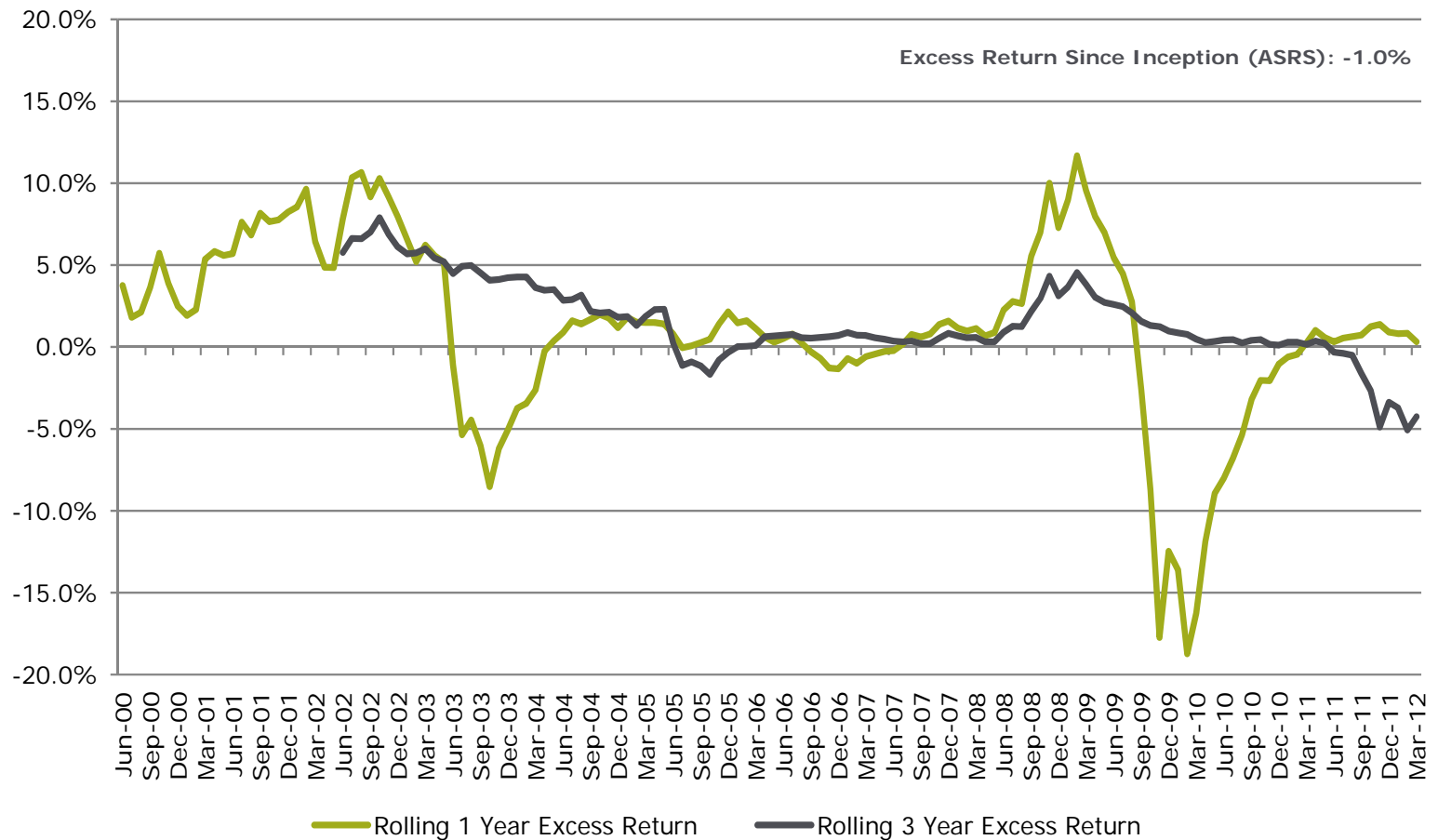
# Columbia Management Investment Advisors, LLC

## Qualitative Analysis

Factors	Description
People	<ul style="list-style-type: none"> <li>• The decision-making process for the Columbia Institutional High Yield Fixed Income strategy is driven and shaped by the High Yield Sector Team.</li> <li>• The team, led by Jennifer Ponce de Leon, includes six sector managers and two portfolio analysts and is responsible for investment strategy, asset allocation, portfolio construction, security selection and trading. The management team has significant depth and continuity, averaging 21 years of firm tenure and 23 years of industry experience.</li> <li>• The High Yield Sector Team partners with a dedicated team of 11 high yield analysts who average 15 years of industry experience and 7 years with the firm. Analysts cover approximately two to four industries and 50 issuers on average.</li> </ul>
Philosophy	<ul style="list-style-type: none"> <li>• The High Yield team focuses on generating strong risk-adjusted returns, while actively managing downside risk consistent with client's objectives and constraints.</li> <li>• Credit selection is critical in high yield investing. The team devotes substantial resources to developing bottom-up fundamental research which typically contributes two-thirds of the alpha generated.</li> <li>• A key to performing in varying market environments is to effectively assess the outlook for financial and economic conditions. By adding a top down overlay approach to the process, the team finds that tactical management can typically contribute one-third of the alpha generated and even higher levels during extreme market conditions or "turns" in the credit cycle.</li> <li>• A constant focus on downside risk is required due to the asymmetrical risk profile of high yield. The approach to portfolio diversification, position size management, and a strong sell discipline are distinguishing features of the strategy's downside risk management capability.</li> </ul>
Process	<ul style="list-style-type: none"> <li>• Analysts and Portfolio Managers work in partnership for idea generation, credit selection and setting investment strategy and positioning.</li> <li>• Credit selection is paramount, and driven by rigorous fundamental analysis and reviewed at the credit roundtable. Credits are monitored on a continuous basis relative to the price target and catalysts set by the analysts.</li> <li>• Relative value decisions are made to trade off risk and reward on the issuers they are investing in and to optimize portfolio positioning.</li> <li>• This approach results in a well diversified portfolio that helps manage downside risk.</li> </ul>

# Columbia Management Investment Advisors, LLC

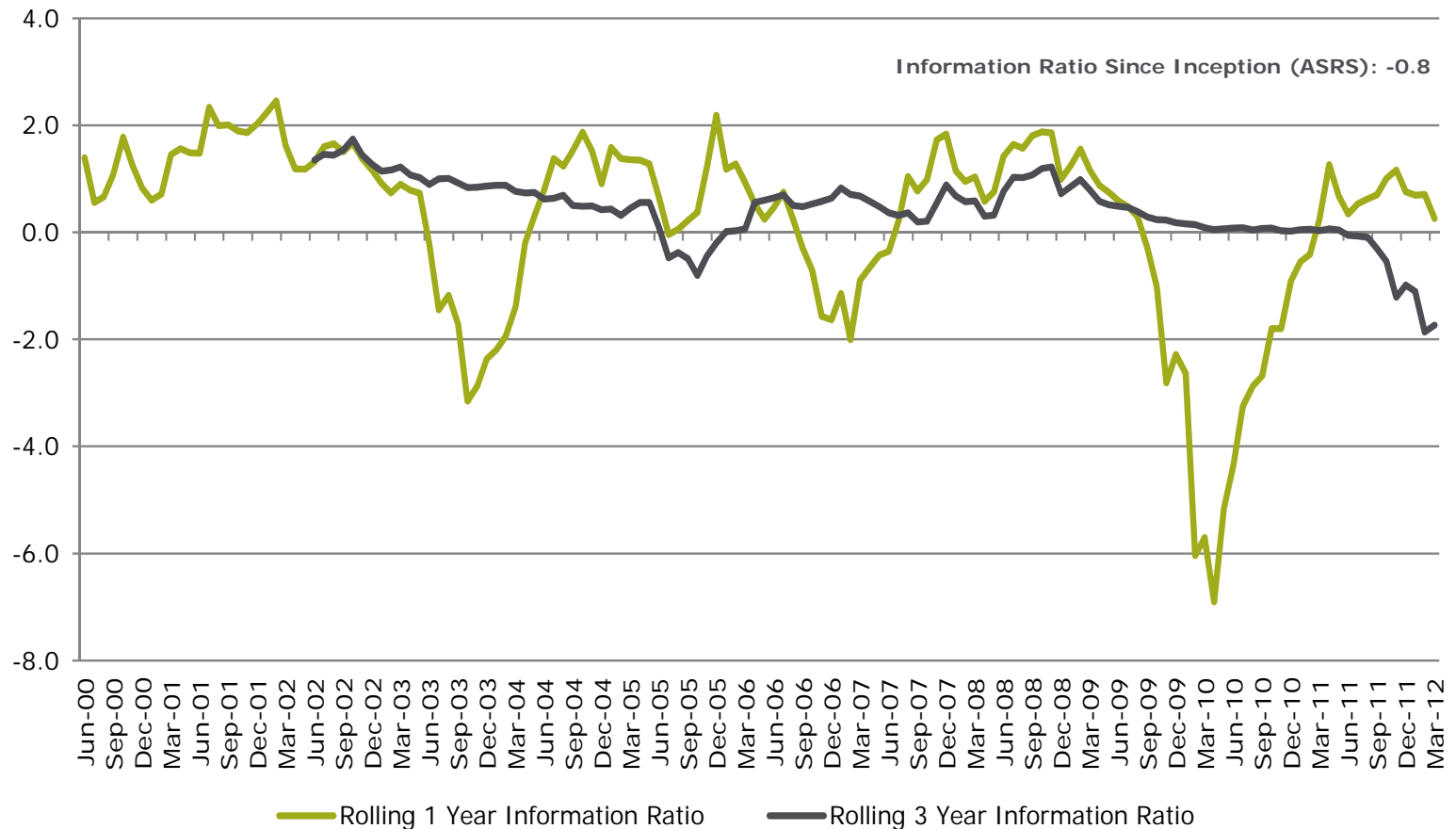
## Columbia vs. Barclays Capital U.S. High Yield Excess Returns Since Inception<sup>1</sup> (June 1999) – March 31, 2012



<sup>1</sup>Net of fee performance of the Columbia Management Investment Advisors, LLC - Columbia Institutional High Yield Fixed Income Composite is linked with ASRS portfolio performance. Composite data provided by eVestment Alliance. Inception date of the ASRS portfolio is September 30, 2009.  
Note: Based on monthly, net of fee performance data, since inception.

# Columbia Management Investment Advisors, LLC

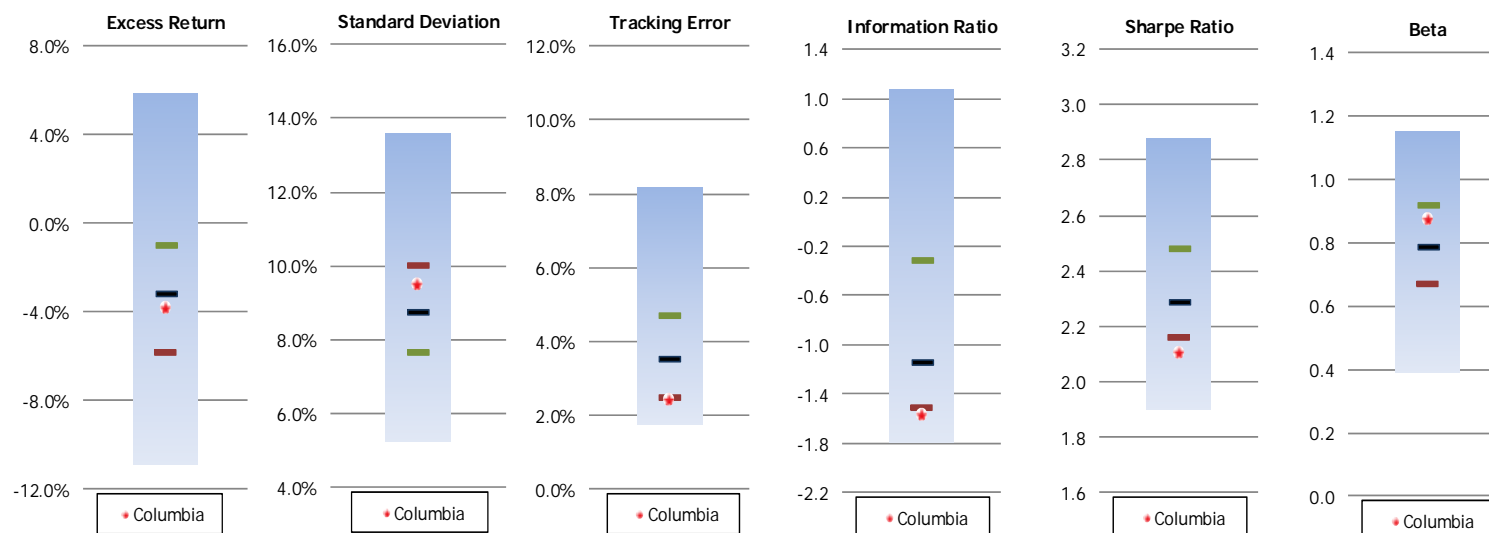
## Columbia vs. Barclays Capital U.S. High Yield Information Ratios Since Inception<sup>1</sup> (June 1999) – March 31, 2012



<sup>1</sup>Net of fee performance of the Columbia Management Investment Advisors, LLC - Columbia Institutional High Yield Fixed Income Composite is linked with ASRS portfolio performance. Composite data provided by eVestment Alliance. Inception date of the ASRS portfolio is September 30, 2009.  
Note: Based on monthly, net of fee performance data, since inception.

# Columbia Management Investment Advisors, LLC

## Columbia vs. Barclays Capital U.S. High Yield Risk and Return Characteristics vs. High Yield Fixed Income Universe For the three-year period ending March 31, 2012<sup>1</sup>



	Excess Return	Standard Deviation	Tracking Error	Information Ratio	Sharpe Ratio	Beta
Columbia	-3.8%	9.5%	2.4%	-1.6	2.1	0.9
Rank	57	66	78	81	84	33
5th Percentile	5.8%	5.2%	8.2%	1.1	2.9	1.2
Upper Quartile	-1.0%	7.7%	4.7%	-0.3	2.5	0.9
Median	-3.2%	8.8%	3.5%	-1.1	2.3	0.8
Lower Quartile	-5.9%	10.0%	2.5%	-1.5	2.2	0.7
95th Percentile	-10.9%	13.6%	1.7%	-1.8	1.9	0.4
Observations	157	157	157	157	157	157

<sup>1</sup>Gross of fee performance of the Columbia Management Investment Advisors, LLC - Columbia Institutional High Yield Fixed Income Composite is linked with ASRS portfolio performance. Composite data provided by eVestment Alliance. Inception date of the ASRS portfolio is September 30, 2009.

Note: Based on monthly, gross of fee performance data, since inception. Universe rankings are against the eVestment Alliance universe of managers as of March 31, 2012.



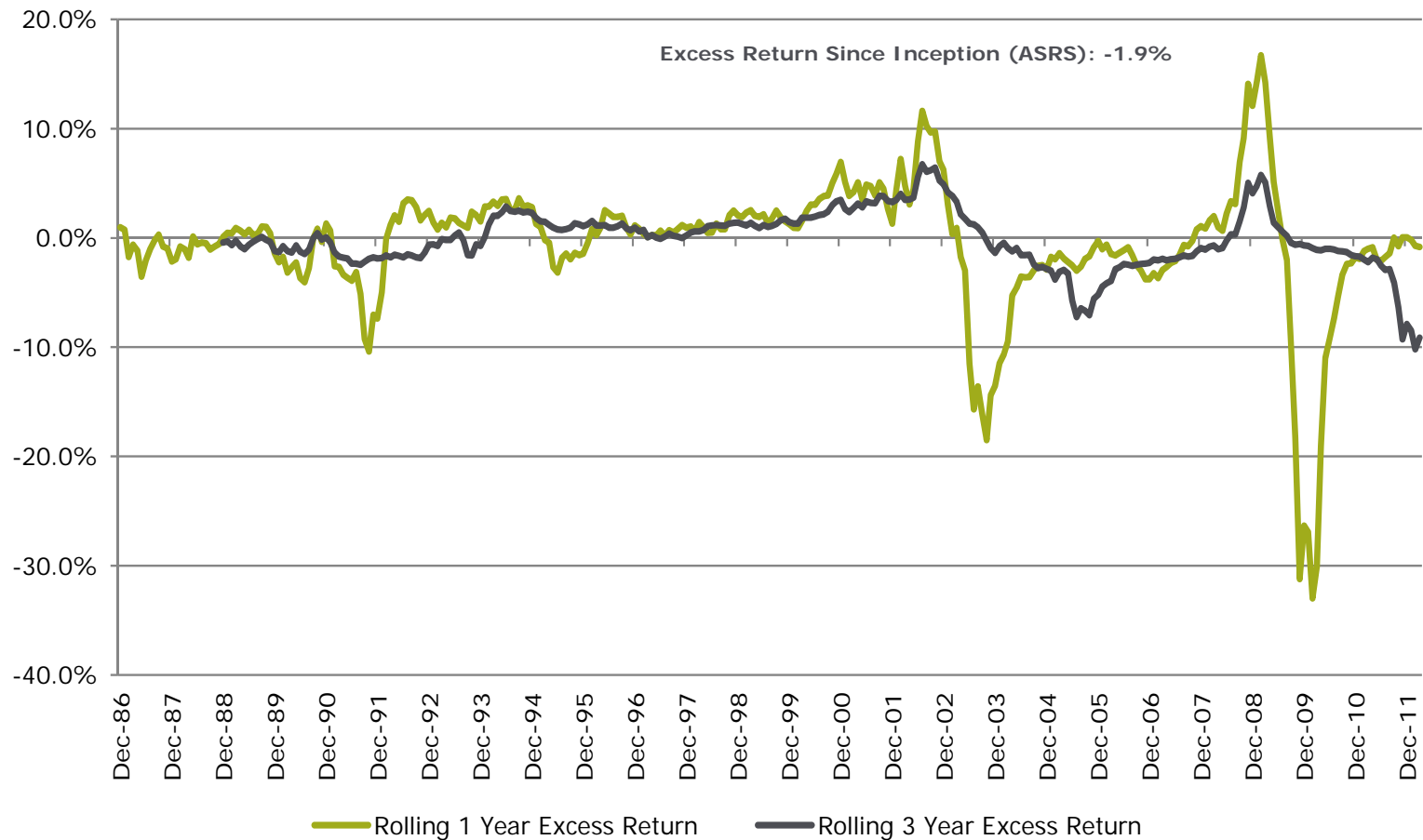
# Shenkman Capital Management, Inc.

## Qualitative Analysis

Factors	Description
People	<ul style="list-style-type: none"> <li>• 91 team members all dedicated to the management of leveraged companies.</li> <li>• Focused solely on one style and one asset class - leveraged finance.</li> <li>• Independently owned by nine senior managers and one outside director; people who manage the assets are owners of the firm.</li> <li>• Profits are invested back in the company - no competing businesses, broker-dealer affiliates, or major financial services company bureaucracy.</li> <li>• Team consists of 30 investment professionals and 50 support staff; with a client to team member ratio of 2:1.</li> <li>• A collegial environment with low professional turnover; over 19 years under the same senior portfolio managers.</li> <li>• 26 years of experience in multiple bull and bear markets.</li> </ul>
Philosophy	<ul style="list-style-type: none"> <li>• Conservative, defensive, prudent (No Style Drift).</li> <li>• Objective is to preserve clients' capital and provide superior risk-adjusted returns over full credit cycles.</li> <li>• "Have the fewest credit mistakes" is the primary goal; find companies with improving credit fundamentals that will pay interest to investors on time.</li> <li>• Outperformance in difficult and uncertain markets.</li> <li>• Culture of compliance with tight risk controls.</li> </ul>
Process	<ul style="list-style-type: none"> <li>• Structured and disciplined bottom-up fundamental research process; Discipline drives performance.</li> <li>• Intensive credit research utilizing internally developed proprietary tools; Credit Score Matrix (C. Scope®) replacing the rating agencies.</li> <li>• Process driven, rules based credit decisions that do not deviate in any market conditions.</li> <li>• In-depth financial models and cash flow analysis.</li> <li>• Innovator of credit risk analysis with low default rate.</li> <li>• Mandatory management contact meetings (4x's a year per credit).</li> <li>• Transparent and open communications with clients; our firm becomes our clients' high yield department.</li> <li>• Clients have access to our entire professional team.</li> </ul>

# Shenkman Capital Management, Inc.

## Shenkman vs. Barclays Capital U.S. High Yield Excess Returns Since Inception<sup>1</sup> (December 1985) – March 31, 2012

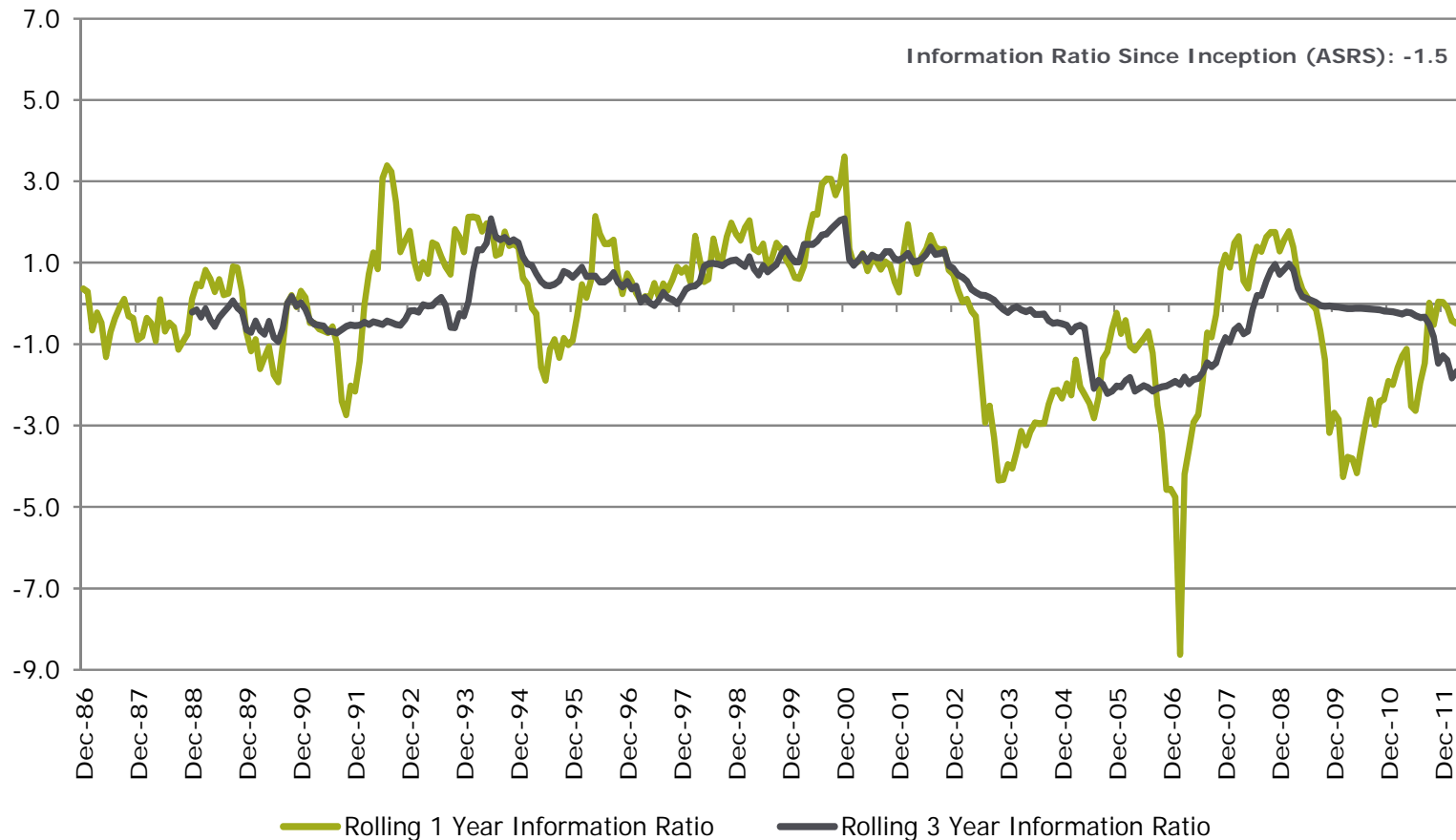


<sup>1</sup>Net of fee performance of the Shenkman Capital High Yield Bond Strategy Composite is linked with ASRS portfolio performance. Composite data provided by eVestment Alliance. Inception date of the ASRS portfolio is September 30, 2009.

*Note: Based on monthly, net of fee performance data, since inception.*

# Shenkman Capital Management, Inc.

## Shenkman vs. Barclays Capital U.S. High Yield Information Ratios Since Inception<sup>1</sup> (December 1985) – March 31, 2012

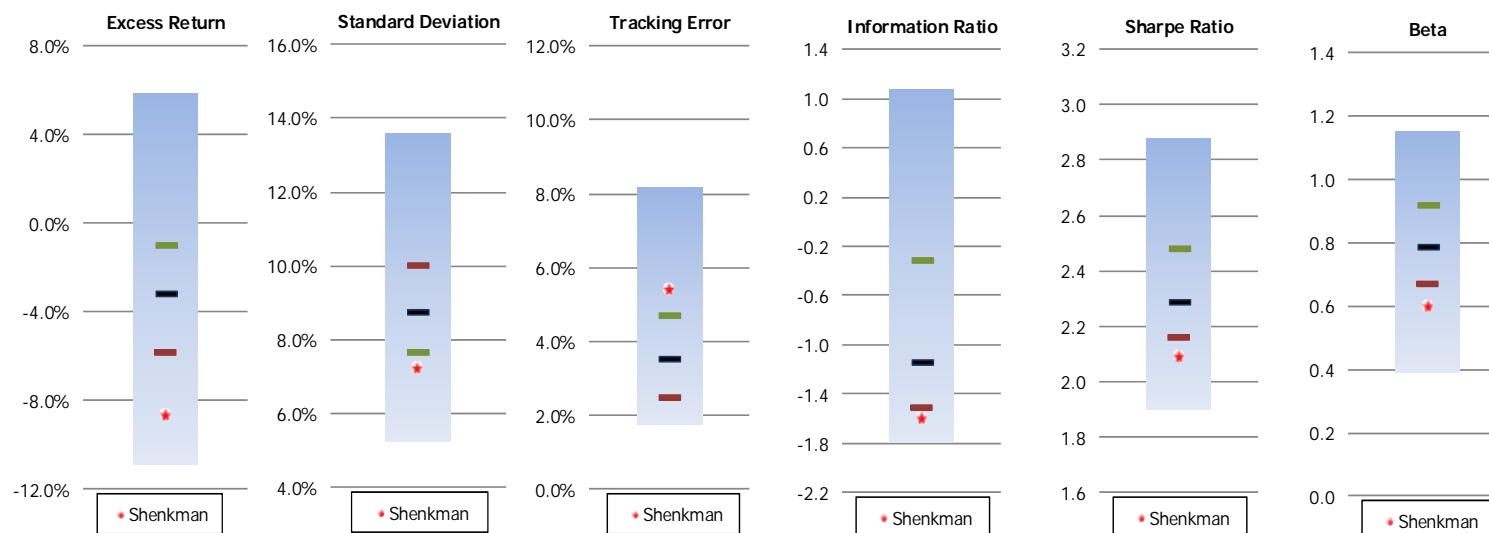


<sup>1</sup>Net of fee performance of the Shenkman Capital High Yield Bond Strategy Composite is linked with ASRS portfolio performance. Composite data provided by eVestment Alliance. Inception date of the ASRS portfolio is September 30, 2009.

*Note: Based on monthly, net of fee performance data, since inception.*

# Shenkman Capital Management, Inc.

## Shenkman vs. Barclays Capital U.S. High Yield Risk and Return Characteristics vs. High Yield Fixed Income Universe For the three-year period ending March 31, 2012<sup>1</sup>



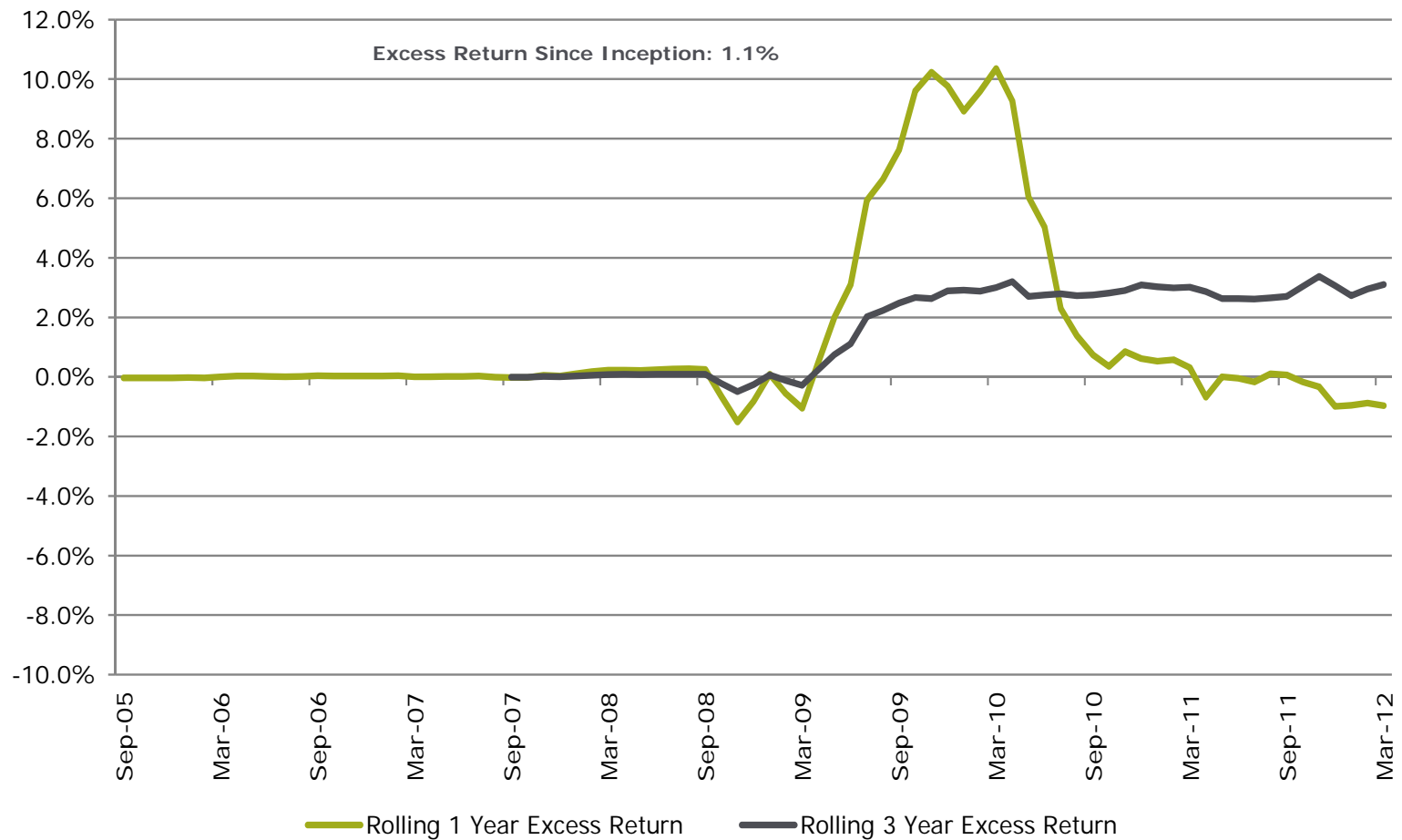
	Excess Return	Standard Deviation	Tracking Error	Information Ratio	Sharpe Ratio	Beta
Shenkman	-8.7%	7.2%	5.4%	-1.6	2.1	0.6
Rank	91	17	18	82	86	87
5th Percentile	5.8%	5.2%	8.2%	1.1	2.9	1.2
Upper Quartile	-1.0%	7.7%	4.7%	-0.3	2.5	0.9
Median	-3.2%	8.8%	3.5%	-1.1	2.3	0.8
Lower Quartile	-5.9%	10.0%	2.5%	-1.5	2.2	0.7
95th Percentile	-10.9%	13.6%	1.7%	-1.8	1.9	0.4
Observations	157	157	157	157	157	157

<sup>1</sup>Gross of fee performance of the Shenkman High Yield Bond Strategy Composite is linked with ASRS portfolio performance. Composite data provided by eVestment Alliance. Inception date of the ASRS portfolio is September 30, 2009.

Note: Based on monthly, gross of fee performance data, since inception. Universe rankings are against the eVestment Alliance universe of managers as of March 31, 2012.

# BlackRock Institutional Trust Company

## BlackRock vs. Barclays Capital U.S. Aggregate Excess Returns Since Inception (September 2004) – March 31, 2012



*Note: Based on monthly, net of fee performance data, since inception.*

# BlackRock Institutional Trust Company

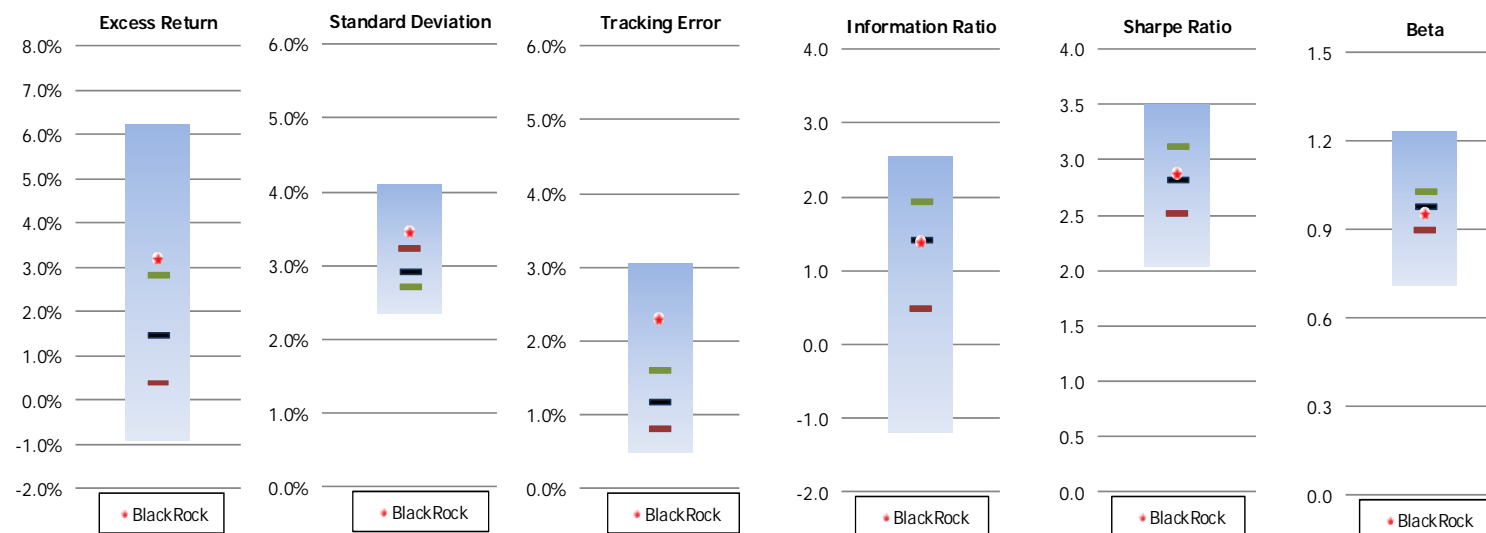
BlackRock vs. Barclays Capital U.S. Aggregate  
Information Ratios Since Inception (September 2004) – March 31, 2012



*Note: Based on monthly, net of fee performance data, since inception.*

# BlackRock Institutional Trust Company

## BlackRock vs. Barclays Capital U.S. Aggregate Risk and Return Characteristics vs. Core Fixed Income Universe For the three-year period ending March 31, 2012

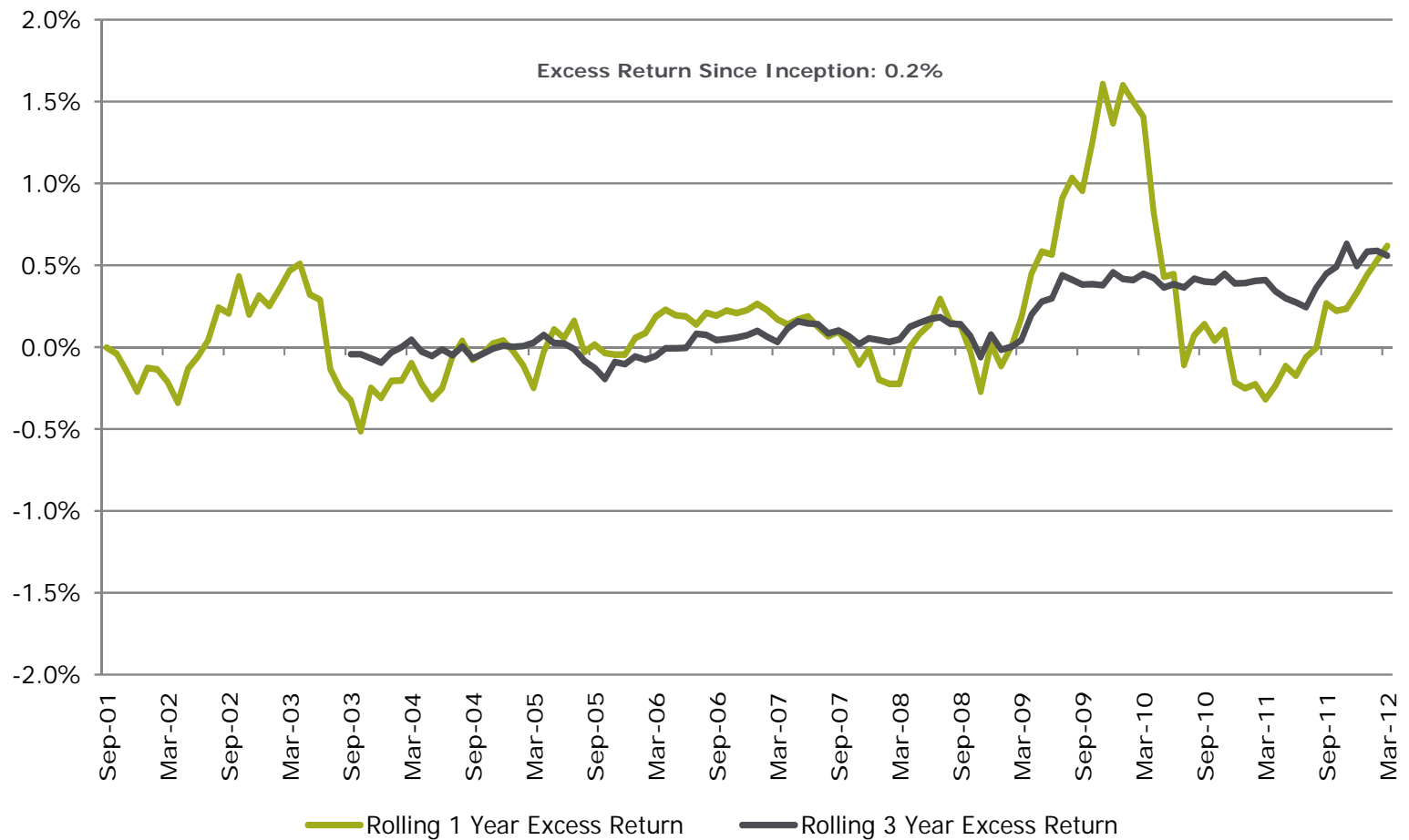


	Excess Return	Standard Deviation	Tracking Error	Information Ratio	Sharpe Ratio	Beta
BlackRock	3.2%	3.4%	2.3%	1.4	2.9	1.0
Rank	22	84	12	52	45	61
5th Percentile	6.2%	2.4%	3.1%	2.6	3.5	1.2
Upper Quartile	2.8%	2.7%	1.6%	1.9	3.1	1.0
<b>Median</b>	<b>1.5%</b>	<b>2.9%</b>	<b>1.2%</b>	<b>1.4</b>	<b>2.8</b>	<b>1.0</b>
Lower Quartile	0.4%	3.2%	0.8%	0.5	2.5	0.9
95th Percentile	-0.9%	4.1%	0.5%	-1.2	2.0	0.7
Observations	253	253	253	253	253	253

Note: Based on monthly, gross of fee performance data, since inception. Universe rankings are against the eVestment Alliance universe of managers as of March 31, 2012.

## Internally Managed F2

F2 vs. Barclays Capital U.S. Aggregate  
Excess Returns Since Inception (September 2000) – March 31, 2012

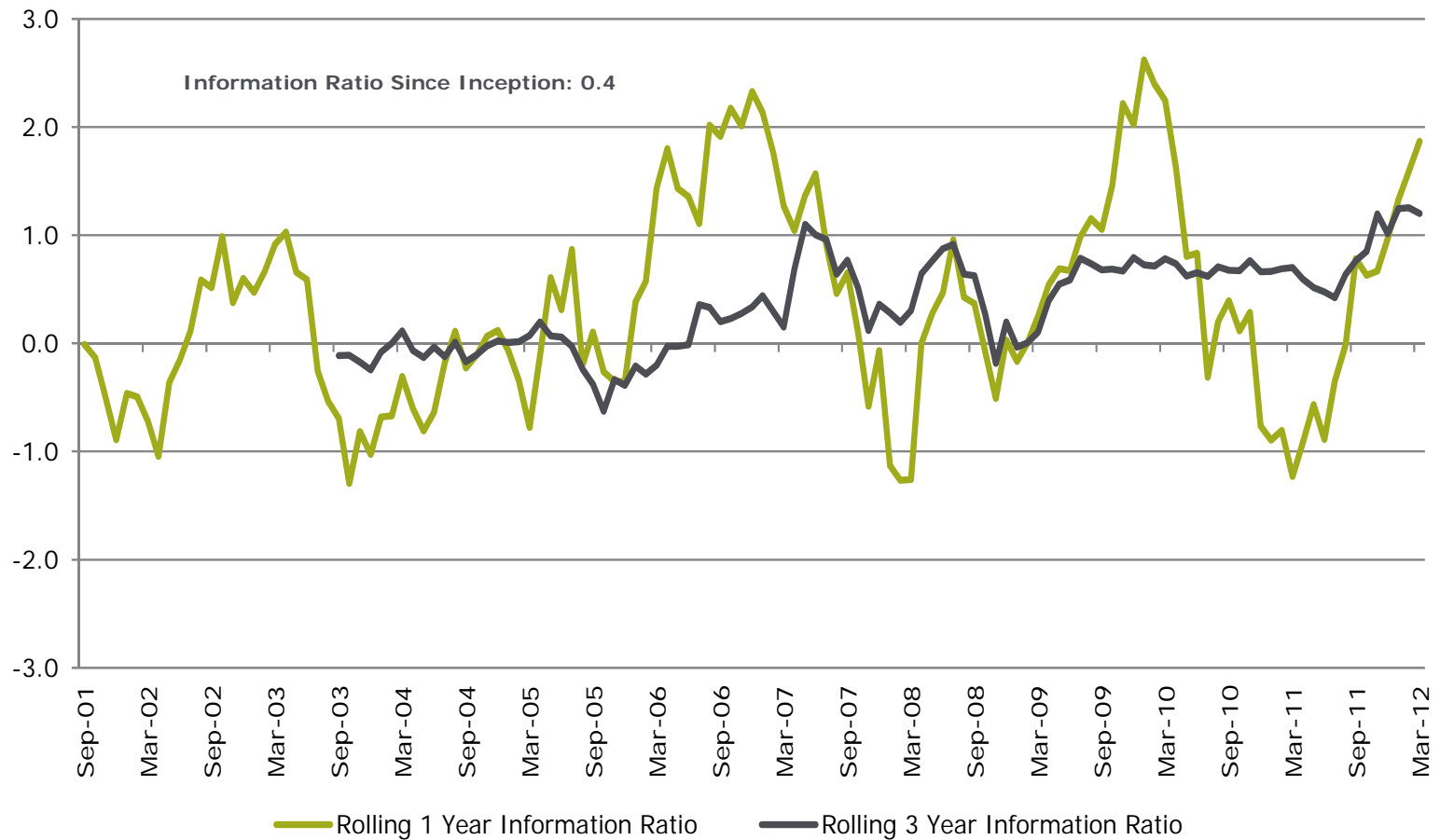


*Note: Based on monthly, net of fee performance data, since inception.*



## Internally Managed F2

F2 vs. Barclays Capital U.S. Aggregate  
Information Ratios Since Inception (September 2000) – March 31, 2012



*Note: Based on monthly, net of fee performance data, since inception.*

# Internally Managed F2

## F2 vs. Barclays Capital U.S. Aggregate Risk and Return Characteristics vs. Core Fixed Income Universe For the three-year period ending March 31, 2012



	Excess Return	Standard Deviation	Tracking Error	Information Ratio	Sharpe Ratio	Beta
F2	0.6%	2.7%	0.5%	1.2	2.7	1.0
Rank	71	27	96	57	64	41
5th Percentile	6.2%	2.4%	3.1%	2.6	3.5	1.2
Upper Quartile	2.8%	2.7%	1.6%	1.9	3.1	1.0
Median	1.5%	2.9%	1.2%	1.4	2.8	1.0
Lower Quartile	0.4%	3.2%	0.8%	0.5	2.5	0.9
95th Percentile	-0.9%	4.1%	0.5%	-1.2	2.0	0.7
Observations	253	253	253	253	253	253

Note: Based on monthly, gross of fee performance data, since inception. Universe rankings are against the eVestment Alliance universe of managers as of March 31, 2012.

## Information Disclosure

- These materials contain summary information regarding the investment management approaches described herein and are not a complete description of the investment objectives, policies, guidelines or portfolio management and research that supports these approaches. This analysis does not constitute a recommendation to implement any of the aforementioned approaches. The information has been obtained from sources NEPC believes to be reliable, but we cannot guarantee its accuracy or completeness.
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